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A UNIT OF GENERAL SIGNAL

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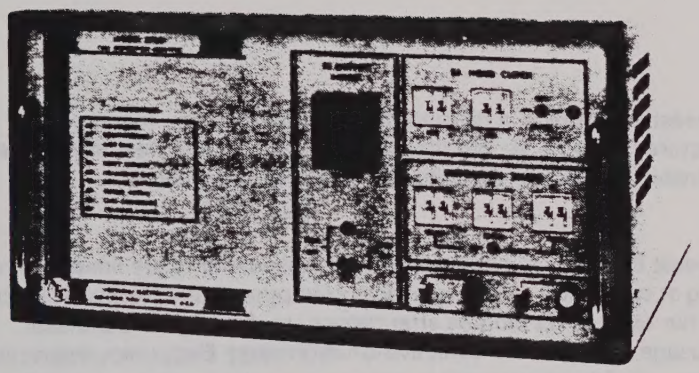

NORTHEAST ELECTRONICS

MODEL 2765
CALL DISPOSITION ANALYZER

northeast electronics
DIVISION OF tau-tron inc.
A UNIT OF GENERAL SIGNAL

No. A2765-00-600 ISSUE 5 DATE FEB 1975

Airport Rd., Concord, N.H. 03301 • (603) 224-6521 • TELEX 94-3453

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SPECIFICATION TITTLE

METROLOGY CALIBRATION PROCEDURE FOR THE

GTE

EQUIPMENT SERVICES CENTER

METROLOGY DEPARTMENT

PRODUCTION ENGINEERING - ESC		
Prepared by		Date
Approved by Equipment Services Superintendent		Date
Approved by Equipment Services Manager		Date
Issue	Spec. No. MCP 2637	Sh. 01 of

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EPC 900.		
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METROLOGY CALIBRATION PROCEDURE

Prepared by

Technically Validated by

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STANDARDS LIST

NOTE: The equipment list below reflects the standards recommended by the calibration procedure of the UUT. Deviations from the recommended standards will be documented on this sheet.

RECOMMENDED STANDARDS	STANDARDS USED

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SECTION 1
DESCRIPTION

1.1 INTRODUCTION.

1.2 This instruction manual provides the necessary information for installation, operation, and maintenance of the Model 2765 Call Disposition Analyzer unit. For installation and operation of the Call Disposition Analyzer (CDA) System, refer to the Call Disposition Analyzer System instruction manual.

1.3 The Northeast Electronics Model 2765, Call Disposition Analyzer is a solid state unit designed to interface and process data required from a variety of NEC dialed number display and trunk access units used in a (CDA) System.

1.4 The processed data is organized into a form, which when applied to a printing unit such as a Teletype®, will yield a hard copy printout of pertinent data relating to call dispositions on a particular trunk group under analysis.

1.5 The Model 2765 can process data monitored on two or four-wire trunks utilizing loop, E&M, or MF signaling, depending on the type of NEC equipment selected for a system. The basic CDA System is capable of serving thirty trunks. This capacity can be expanded to a maximum of ninety trunks with the proper options installed in the Model 2765 unit. The options make it possible to parallel NEC trunk access units to serve sixty or ninety trunks. Call selection is on a first come first served basis.

1.6 The Model 2765 unit provides a clock for time of seizure printout, identification circuits to determine the circuit under test, off-hook supervision detectors (incoming and terminating), number dialed or pulsed, busy, reorder and ringing detectors, plus adjustable timing circuits for determining call disposition. All of this information is converted to standard ASCII code on a 20 ma current loop for operation of a Model ASR 33 Teletype® or similar printer requiring this input. A standard RS 232C output is also provided for an input to modems (data sets) such as a Western Electric 108D modem. The printout on completed calls can be inhibited to reduce the amount of output data to the printer. In this mode of operation, the number of completed calls observed are totaled and displayed via a front panel counter.

1.7 The basic unit of the Model 2765 recognizes up to nine different call dispositions and, on an optional basis, the Computer Answered and Blue Box disposition.

1.8 A typical CDA System consists of an NEC Model 2776 Thirty Trunk Access Unit, a Model 2762 Dialed Number Display Unit, a Model 2765 Call Disposition Analyzer and a customer owned Teletype® or similar printer. Other unit combinations are described in the installation instructions.

SECTION 2

SPECIFICATIONS

2.1 INTRODUCTION.

2.2 Table 2–1 lists the specifications for the Model 2765 Call Disposition Analyzer.

Table 2–1. Model 2765 Specifications.

OPERATIONAL

ASSOCIATED EQUIPMENT REQUIRED:

Trunk Access Unit (s)	TN 76 or Model 2776
Signal Display Unit	TTS 76,TTS 2761(R), or TTS 2762 (R)

INPUT LINE SELECTION (L1,L2):

L1 monitor for tones	E lead or loop seizure
L2 monitor for tones	M lead seizure

DISPOSITIONS:

00 No Decision	a. Energy detected after EOD* Pattern ≠ busy,reorder, or ring Calling party disconnects before T1**. b. No digits dialed for 31 to 32 seconds after valid seizure.
01 Completed Call	Answer supervision detected after EOD.
02 Busy	60 IPM Busy detected after EOD.
03 Reorder	120 IPM Reorder detected after EOD.
04 Don't Answer	a. Audible ringing detected after EOD. No Answer Calling party disconnects between T2 and T3. b. Audible ring detected after EOD. Ringing continues to T3 without answer supervision
05 No Answer Supv.	Audible ring detected after EOD. Ringing stopped for ⩾ 7 seconds before T3. No answer supervision for ⩾ 7 seconds after ringing stopped.
06 No Ring, No Answer	a. Calling party disconnect between T1 and T3 No audible ring detected. No answer supervision

Table 2–1 (cont'd)

	b. Calling party holds to T3 No audible ring detected No answer supervision
07 Sender Retrial	Loss of seizure on Loop or, E and M both off hook or both on-hook. Duration: ⩾ 0.89 sec, ±0.3 sec. Measured: 3.89 – 4.89 sec after seizure Condition: No digits dialed
08 Call Abandoned	a. Audible ring detected No answer Calling party disconnect between EOD and T2 b. No ring detected No answer Calling party disconnect between first digit and T1
09 Computer Answer (option)	2125 Hz detected ⩽ 4 seconds after answer supervision
10 Blue Box (option)	2600 Hz detected between: EOD and ans. supv. plus 4 seconds EOD and T3, or EOD and calling party disconnect

* End of dialing
** Times T1,T2 and T3 are set on front panel.

ELECTRICAL

INPUT CHARACTERISTICS (L1,L2)

Input Impedance	⩾60 kohms, balanced
Balance	⩾50 dB, 200 – 1000 Hz
DC Blocking	100 V
Selection:	
L1	E lead or loop seizure
L2	M lead seizure

TONE DETECTION – GENERAL

Bandwidth	200 Hz – 600 Hz unless specified
Tone Present	Continuous for specified period Dropouts ⩽ 10msec. unless specified
No Tone Present	Continuous for specified period Transients ⩽ 10msec. unless specified
Tone Level Ref.	0 dBm, 600 ohms

TONE DETECTION – SPECIFIC

Tone Energy ("00" Disposition)

Level	⩾ –38 dBm
Duration	⩾150 msec
Timing	≠ Busy, Reorder, or Ring

Table 2—1 (cont'd).

Busy	
Level (dBm)	TONE ≥ -20, NO TONE ≤ -27 / TONE ≥ -38, NO TONE ≤ -45
Timing (secs.)	0, 0.42, 0.67, 0.92, 1.07, 1.34
Transitions	Single transitions within indicated windows. No further transitions before 1.34 seconds.
Reorder	
Level (dBm)	TONE ≥ -20, NO TONE ≤ -27 / TONE ≥ -38, NO TONE ≤ -45
Timing (secs)	0, 0.19, 0.31, 0.48, 0.52, 0.67
Transitions	Single transitions within inidcated windows. No further transitions before 0.67 seconds.
Audible Ringing	
Level (dBm)	TONE ≥ -38, NO TONE ≤ -45
Timing (secs)	0.78, 0.97
Transitions	Single transitions as indicated
Dropouts (Tone Periods)	⩽ 100 msec.
Transients (Quiet Periods)	⩽ 100 msec.
2125 Hz	
Bandwidth	2125 Hz ±50 Hz
Level	⩾ −35 dBm
Duration	⩾ 1 second
2600 Hz	
Bandwidth	2600 Hz ±50 Hz
Level	⩾ 50 dBm
Duration	⩾ 150 msec.
Line Selection	
4W	Transmit Pair
2W	N.A.

DISPOSITION TIMERS (T1,2,3)

Range	1 sec. to 99 secs.
Resolution	1 sec.
Accuracy	±1 sec.

24 HOUR CLOCK

Range	.0001 to 2400
Set Resolution	1 minute
Accuracy	Depends on power line frequency Typically < ±5 min./day

DATA OUTPUT

Format:	
Code	8 level ASCII
Parity	Even
Transmission	Serial, 11 unit code
Rate	110 Baud
Distortion	⩽ 20%

Table 2—1 (cont'd).

Current Output (TTY):	
Current	20 mA nominal (adj)
Max. load res. @ 20mA	550 ohms (ground return)
Polarity (spade lugs)	
Red lead	Current source (+)
Black lead	Return (Nema ground in Model 2765)
Voltage Output (RS—232—C):	
Connector	25 pin
Data (pin 2)	
Voltage (open circuit)	±15 V ±5 %
Resistance	1.5kohms ±10 %
Data Term. Ready (pin 20)	
Voltage (open circuit)	+15 V ±5 %
Resistance	2.2 kohms ±10 %
Signal Common (pin 7)	Nema ground inside Model 2765
POWER	115/230 volts ±10 % 50 Hz to 60 Hz ≅ 60 watts
MECHANICAL	
CASE DIMENSIONS	8 23/32* in. h x 17in. w x 18 5/8in. d (221.5mm x 431.8mm x 473.1mm)
WEIGHT	37 lb. (16.8kg)
MOUNTING	Portable or 19 inch rack (483mm)

*** plus 5/8 inches for removable rubber feet**

ENVIRONMENTAL	
AMBIENT TEMPERATURE	
Operating	+10 ° to +40 °C
Storage	−25 ° to +85 °C
RELATIVE HUMIDITY	to be announced
SHOCK AND VIBRATION	to be announced

SECTION 3

INSTALLATION AND OPERATION

3.1 INTRODUCTION.

3.2 This section provides the necessary information for installation and operation of the Model 2765 unit in a Call Disposition Analyzer (CDA) System. For system installation and operation refer to the CDA System instruction manual.

3.3 To avoid confusion, the model 2765 Call Disposition Analyzer unit will be referred to as the Model 2765 and the Call Disposition Analyzer System will be referred to as the CDA System.

3.4 In this section visual inspection is covered by paragraphs 3.5 through 3.7. Installation instructions are provided by paragraphs 3–8 through 3–15, followed by operating instructions contained in paragraphs 3–16 through 3–32.

3.5 VISUAL INSPECTION.

3.6 The basic Model 2765 is shipped with:

a. One extender printed circuit board (E95205).

b. One, 8-ft. (243.8 cm), 18-gauge, three-wire power cord.

c. Two rack brackets for 19 in. (472.6 mm) rack mounting; rack mounting brackets for 23 in. (584.2 mm) rack mounting optional.

d. Five interconnection cables. Check the interconnection cables with Figures 3–2 through 3–6 for proper identification.

3.7 Examine the Model 2765 for damage or loose components due to shipment. To do this, remove four retaining screws located at the four corners in the rear of the Model 2765 case. Slide the unit out of its case and check the following:

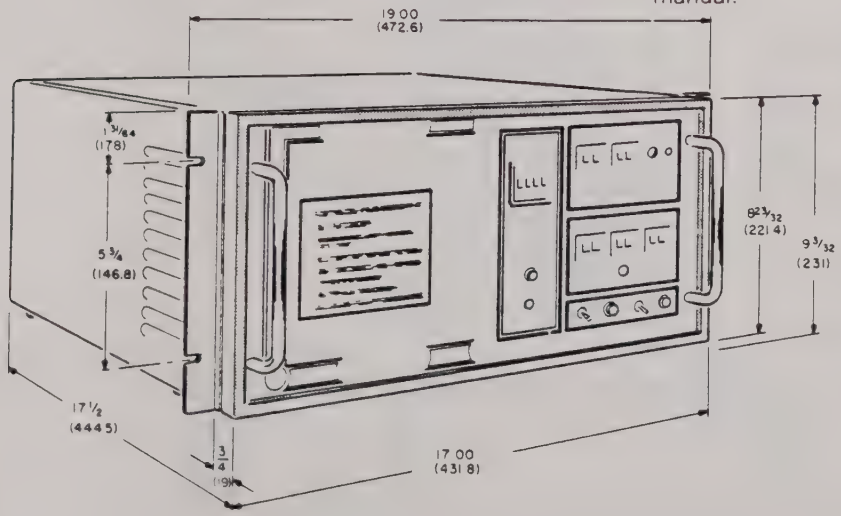
a. All printed circuit boards are firmly inserted into their respective jacks and all components are in place.

b. The two printed circuit board retainer brackets located above printed circuit boards are in place and secured.

c. Loose hardware or components in bottom of case.

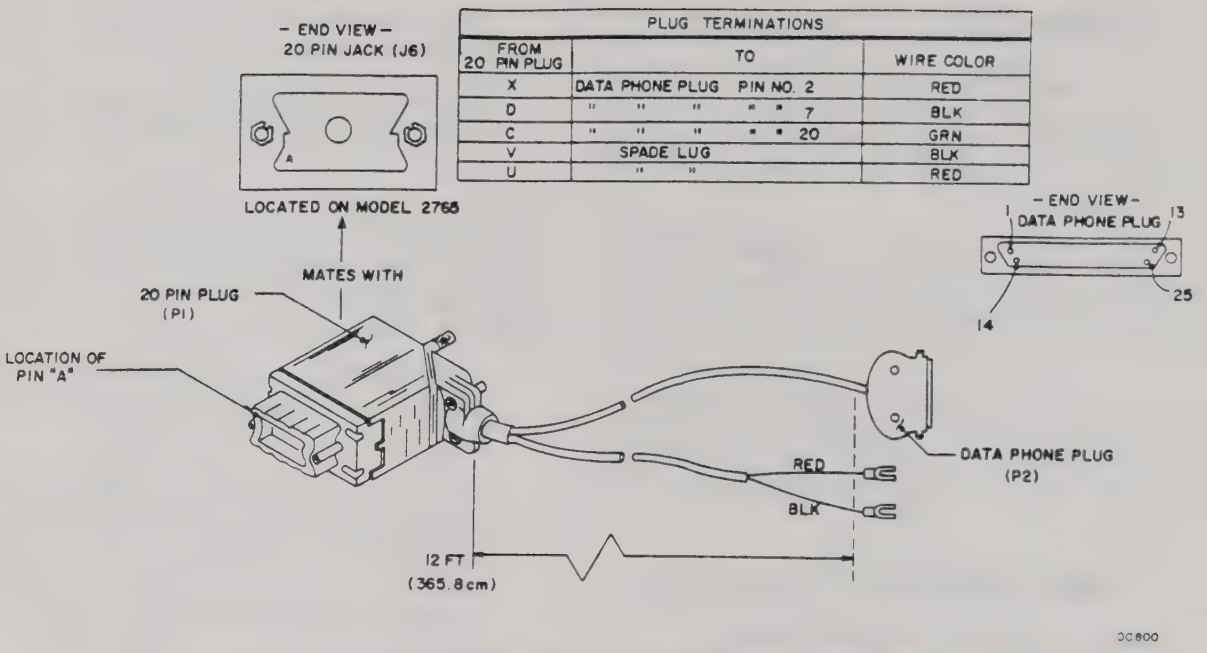
3.8 INSTALLATION.

3.9 The following does not include electrical adjustments that might be needed upon installation. For this information refer to the CDA System instruction manual.



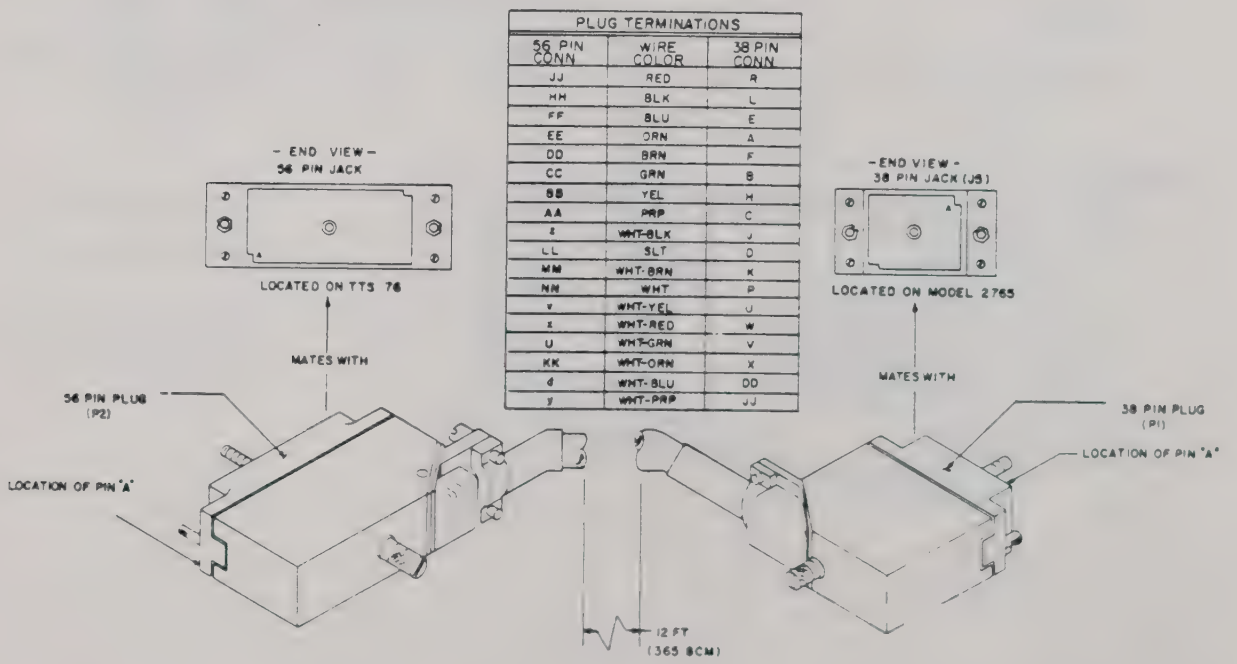
NOTES
1. UNIT SHOWN WITH 19" (472.6) MOUNTING BRACKET WHEN MOUNTED IN RACK. REMOVE RUBBER FEET.
2. ALL DIMENSIONS IN INCHES & (mm).

Figure 3–1. Model 2765, Dimensions, Rack Mounting Installation Diagram.



PLUG TERMINATIONS		
FROM 20 PIN PLUG	TO	WIRE COLOR
X	DATA PHONE PLUG PIN NO. 2	RED
D	" " " " " 7	BLK
C	" " " " " 20	GRN
V	SPADE LUG	BLK
U	" "	RED

Figure 3–2. Model 2765, TTY Interconnection Cable (W1).



PLUG TERMINATIONS		
56 PIN CONN	WIRE COLOR	38 PIN CONN
JJ	RED	R
HH	BLK	L
FF	BLU	E
EE	ORN	A
DD	BRN	F
CC	GRN	B
BB	YEL	H
AA	PRP	C
Z	WHT-BLK	J
LL	SLT	D
MM	WHT-BRN	K
NN	WHT	P
Y	WHT-YEL	U
X	WHT-RED	W
U	WHT-GRN	V
KK	WHT-ORN	X
d	WHT-BLU	DD
y	WHT-PRP	JJ

Figure 3–3. Model 2765, TTS 76 Interconnection Cable (W2).

PLUG TERMINATIONS	
38 PIN PLUG	33 PIN PLUG
R	F1
L	A6
E	F3
A	B3
F	B1
B	A7
C	F5
W	H2
U	H4
T	F7
P	H3
N	H6
K	A5
J	A4
D	A3
H	F2
JJ	A2
DD	C2

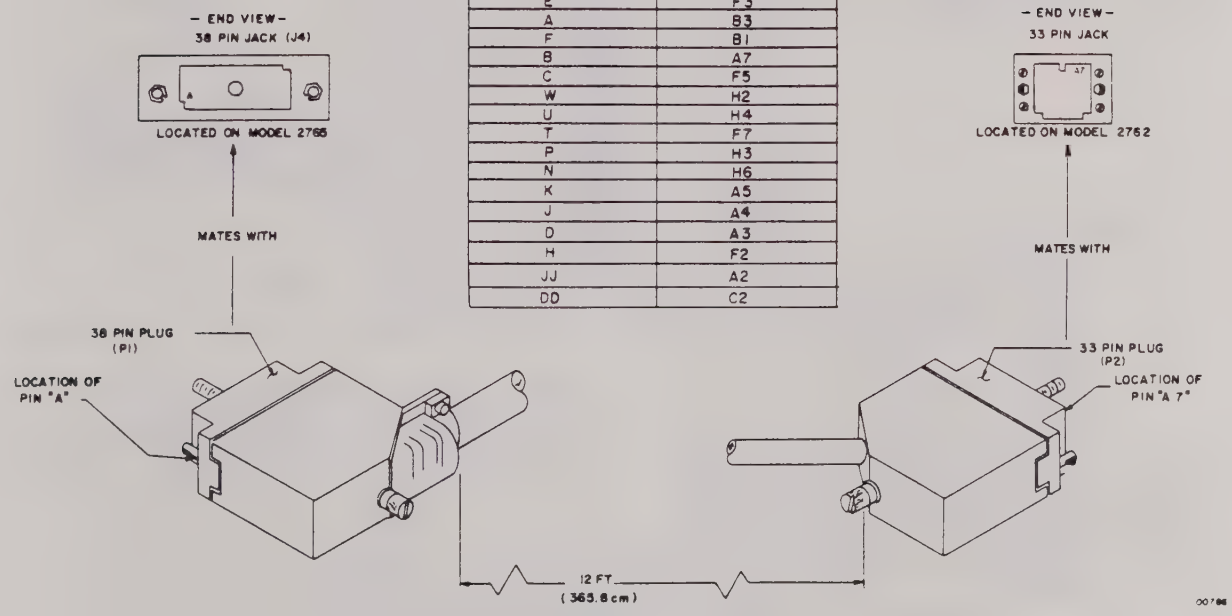


Figure 3–4. Model 2765, TTS 2761 and TTS 2762 Interconnection Cable (W3).

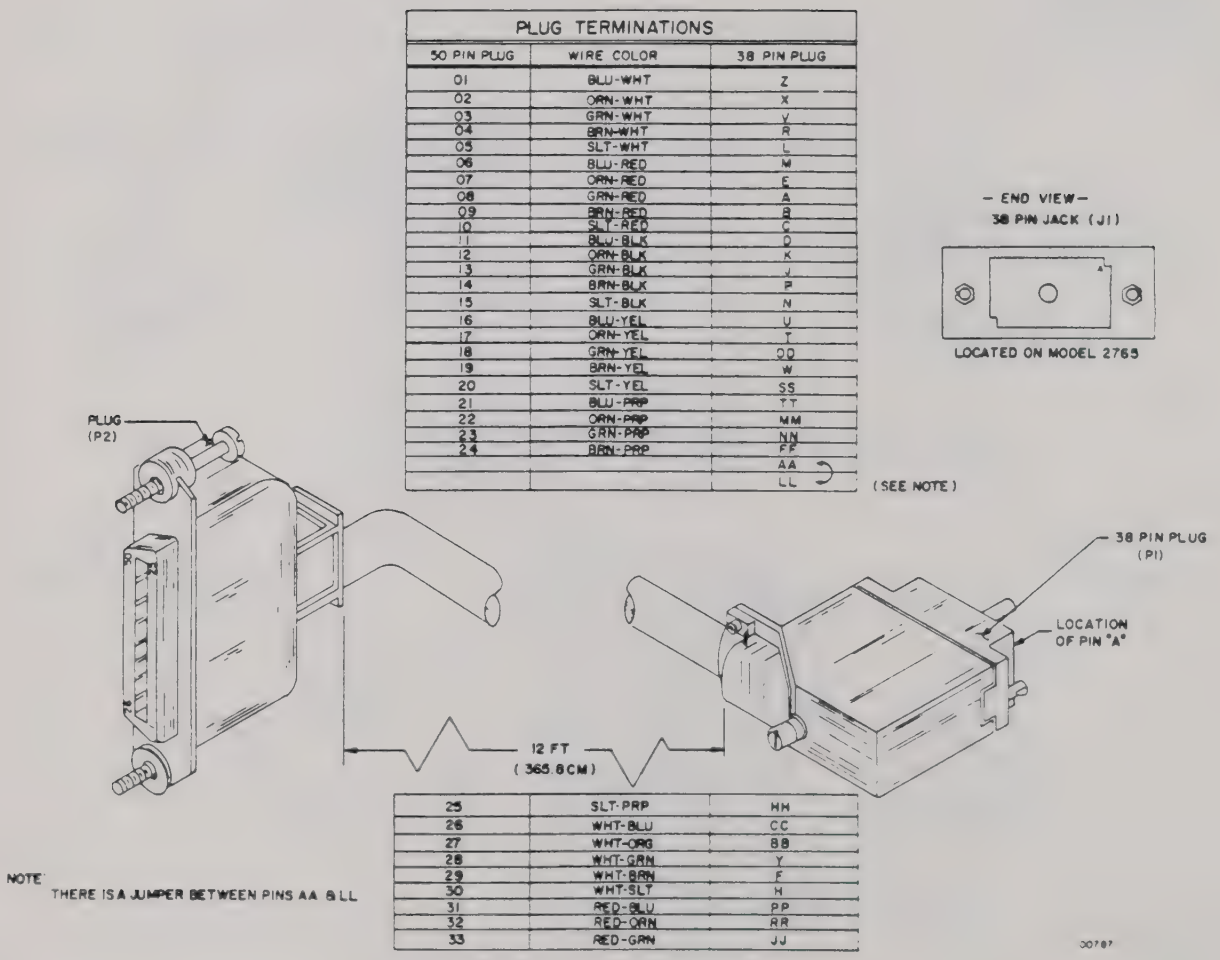

PLUG TERMINATIONS
50 PIN PLUG | WIRE COLOR | 38 PIN PLUG
01 | BLU-WHT | Z
02 | ORN-WHT | X
03 | GRN-WHT | V
04 | BRN-WHT | R
05 | SLT-WHT | L
06 | BLU-RED | M
07 | ORN-RED | E
08 | GRN-RED | A
09 | BRN-RED | B
10 | SLT-RED | C
11 | BLU-BLK | D
12 | ORN-BLK | K
13 | GRN-BLK | J
14 | BRN-BLK | P
15 | SLT-BLK | N
16 | BLU-YEL | U
17 | ORN-YEL | T
18 | GRN-YEL | DD
19 | BRN-YEL | W
20 | SLT-YEL | SS
21 | BLU-PRP | TT
22 | ORN-PRP | MM
23 | GRN-PRP | NN
24 | BRN-PRP | FF
AA
LL
(SEE NOTE)
25 | SLT-PRP | HH
26 | WHT-BLU | CC
27 | WHT-ORG | BB
28 | WHT-GRN | Y
29 | WHT-BRN | F
30 | WHT-SLT | H
31 | RED-BLU | PP
32 | RED-ORN | RR
33 | RED-GRN | JJ
- END VIEW -
38 PIN JACK (J1)
LOCATED ON MODEL 2765
PLUG (P2)
38 PIN PLUG (P1)
LOCATION OF PIN "A"
12 FT (365.8CM)
NOTE
THERE IS A JUMPER BETWEEN PINS AA & LL
00787

Figure 3—5. Model 2765, Model 2776 and TN 76 Interconnection Cable (W4).

NOTE

To facilitate installation of Model 2765 in the CDA System, all Model 2765 units after serial number 99 will be shipped with the Model 2776 Interconnection Cable (W5) illustrated in Figure 3—6.

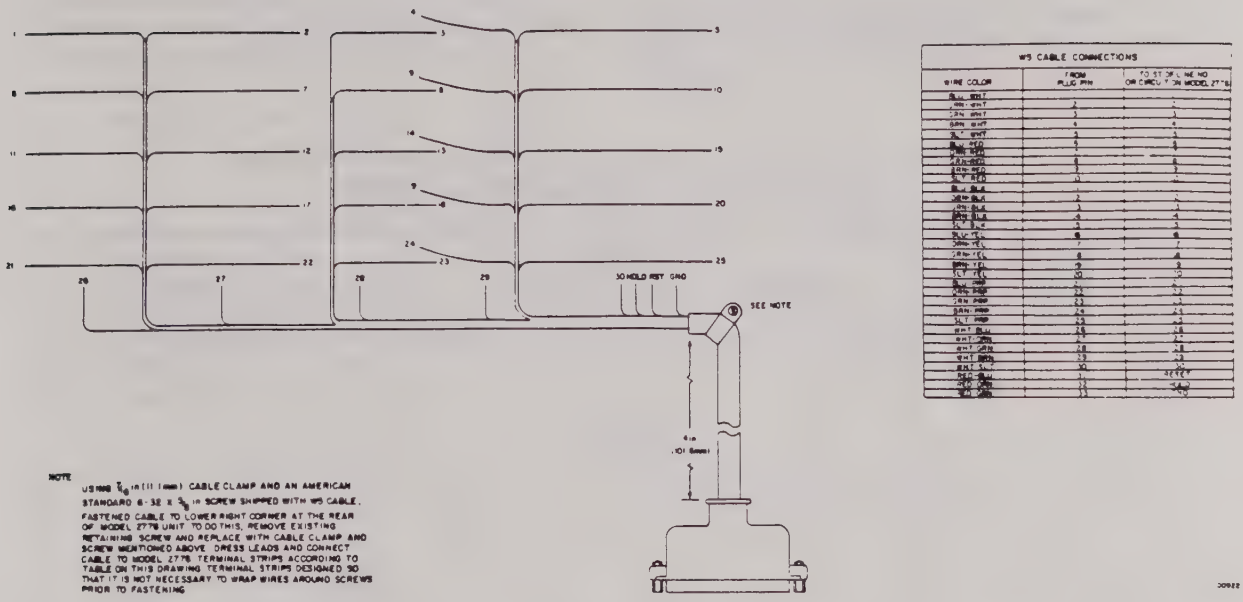

W5 CABLE CONNECTIONS
WIRE COLOR
FROM PLUG PIN
TO ST OR LINE NO OR CIRCUIT ON MODEL 2776
SEE NOTE
30 HOLD RST GND
NOTE
USING 5/16 in (11.1mm) CABLE CLAMP AND AN AMERICAN STANDARD 6-32 X 3/8 in SCREW SHIPPED WITH W5 CABLE, FASTENED CABLE TO LOWER RIGHT CORNER AT THE REAR OF MODEL 2776 UNIT. TO DO THIS, REMOVE EXISTING RETAINING SCREW AND REPLACE WITH CABLE CLAMP AND SCREW MENTIONED ABOVE. DRESS LEADS AND CONNECT CABLE TO MODEL 2776 TERMINAL STRIPS ACCORDING TO TABLE ON THIS DRAWING. TERMINAL STRIPS DESIGNED SO THAT IT IS NOT NECESSARY TO WRAP WIRES AROUND SCREWS PRIOR TO FASTENING

Figure 3—6. Model 2765, Model 2776 Interconnection Cable (W5).

3.10 Hardware is provided for 19 in. (482.6 mm) rack mounting. Adapters for 23 in. (584.2 mm) rack mounting can be obtained from Northeast Electronics. Prior to rack mounting, refer to Figure 3—1 and perform the following:

a. Remove four retaining screws located at the four corners in the rear of the Model 2765 case, then slide the unit out of its case.

b. Remove four rubber feet from bottom of the case.

c. Fasten two brackets for 19 in. (512.6 mm) or 23 in. (584.2 mm) rack mounting to the case by inserting supplied 10—32 flat—head screws through inside of case to the brackets.

d. Slide unit back into case and secure with four retaining screws mentioned in step a, above.

NOTE

Model 2765 unit is serviced from the front. Make sure that cables connected to rear of unit have service loops long enough, approximately 1.5 feet (46 cm) to allow chassis to be pulled out of case for servicing.

CAUTION

Intake and exhaust vents located on both sides of Model 2765 must not be obstructed or unit will overheat and damage will result.

3.11 The model 2765 can be used with a variety of NEC Dial Number Display and Trunk Access units in order to form a CDA System. A list of the NEC Signal Display and Trunk Access units are provided in Table 3—1 along with their capabilities when in a CDA System. The table provides the following information

a. Model number

b. Type of unit, Signal Display or Trunk Access unit.

c. Operation with trunks seized from one direction only (one way) or trunks seized from either direction (two way)

d. Type of signaling recognized by the unit when used in the system: loop DP, E or M DP, or MF signaling.

e. Type of supervision.

Table 3—1. Signal Display and Trunk Access Unit Capabilities in the 2765 Call Disposition Analyzer System

Model No.	Unit Type	One or Two Way Trunks	Signaling	Supervision
TTS 2762	Signal Display	1 or 2 Way	MF E or M DP Loop DP	E&M Reverse Bat.
TTS 2761	Signal Display	1 or 2 Way	MF	E&M
TTS 76	Signal Display	1 Way	MF E or M DP Loop DP	E&M Reverse Bat.
TN 76	Trunk Access	1 Way	MF E or M DP *Loop DP	E&M Reverse Bat.
2776	Trunk Access	1 or 2 Way	MF E or M DP *Loop DP	E&M Reverse Bat.

***Requires trunk seizure information on sleeve lead when observing loop circuits.**

3.12 The Model 2765 is not electronically compatible with all older NEC Trunk Access and Signal Display units. If older units are used in a system, they may need modifications. TTS 2762 units do not need modification. To determine if Models TN 76, 2776,TTS 76, or TTS 2761 have been modified, refer to interconnection installation diagrams, Figures 3—7 through 3—10. (M) will locate the modification. A brief note will describe how to verify if modifications have been made. If unit modifications are necessary, contact Northeast Electronics or your local sales representative for additional information

3.13 To facilitate installation of the Model 2765 unit in a CDA System, Figures 3—2 through 3—6 are provided for interconnection cable identification and plug to jack keying. Table 3—2, Model 2765 Installation Diagrams, provides easy selection of proper installation diagrams, Figures 3—7 through 3—10, for a particular system configuration.

3.14 The Model 2765 is connected to other units in a CDA System using some or all interconnecting cables shipped with the Model 2765 unit, plus standard patch cords terminated at both ends with 310 type plugs. Refer to Figures 3—2 through 3—6 for cable identification, jack keying information for proper installation of plugs to their associated jack, and cable lead identification

CAUTION

Cable plugs will only make contact when inserted into their intended jacks. Care should be taken to make sure keying is matched prior to insertion. Otherwise, open circuits, broken plugs, or jacks may result.

3.15 To select the proper installation diagrams, first determine the NEC Trunk Access and Signal Display unit to be used in the system and then refer to Table 3–2 for proper installation diagrams.

Example: Models TN 76 and TTS 76 are used in a CDA System with the Model 2765 Call Disposition Analyzer. Referring to Table 3–2, it indicates that Figures 3–7 and 3–9 are the installation diagrams to use for this particular system configuration.

Table 3–2. Model 2765 Installation Diagrams

Trunk Access Unit (Model No.)	Dial and Display Unit (Model No.)	Installation Diagram (Fig. No.)
TN 76	•••••	3–7
2776	••••	3–8
••••	TTS 76	3–9
••••	TTS 2761	3–10
••••	TTS 2762	3–10

NOTE

When installing the Model 2765 in a system, note the following:

a. Connections to L1 and L2 jacks on various units in the system are made according to installation drawings, making sure that trunk seizure indication on M lead reflects reception of supervision tones on L2 and trunk seizure indication on E lead reflects reception of supervision tones on L1. This assures that Model 2765 correctly identifies direction of call.

b. Only Line 1 (L1) on the Model 2765 is used when monitoring loop circuits.

c. Voltage between earth ground and main-frame ground should be less than 0.5 volts potential (ac or dc). If voltage is greater than 0.5 volts isolate third lead (NEMA ground) of Model 2765 power plug, then strap the third lead to a clean main-frame ground or connect a lead from Model 2765 chassis to a clean main-frame ground.

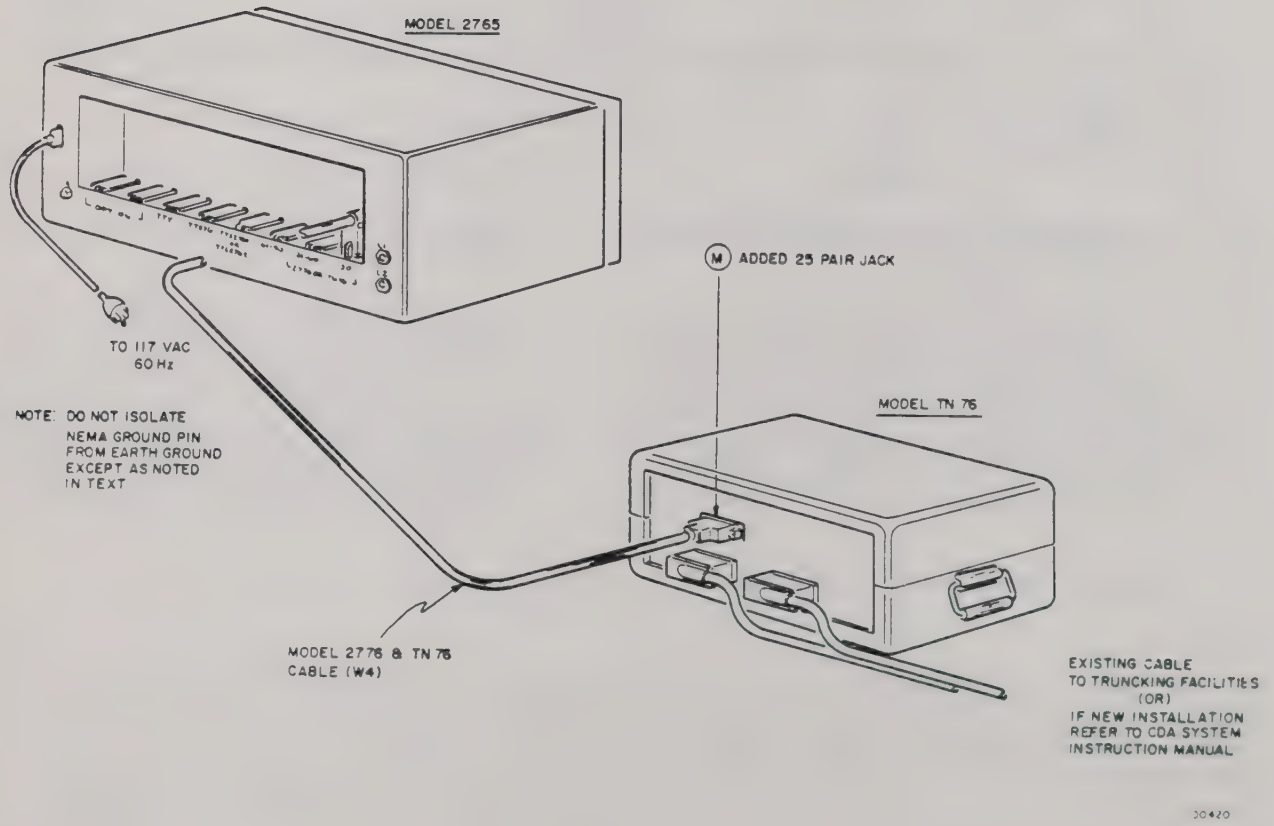


Figure 3—7. Model 2765, Installation Diagram for Connection with Model TN76.

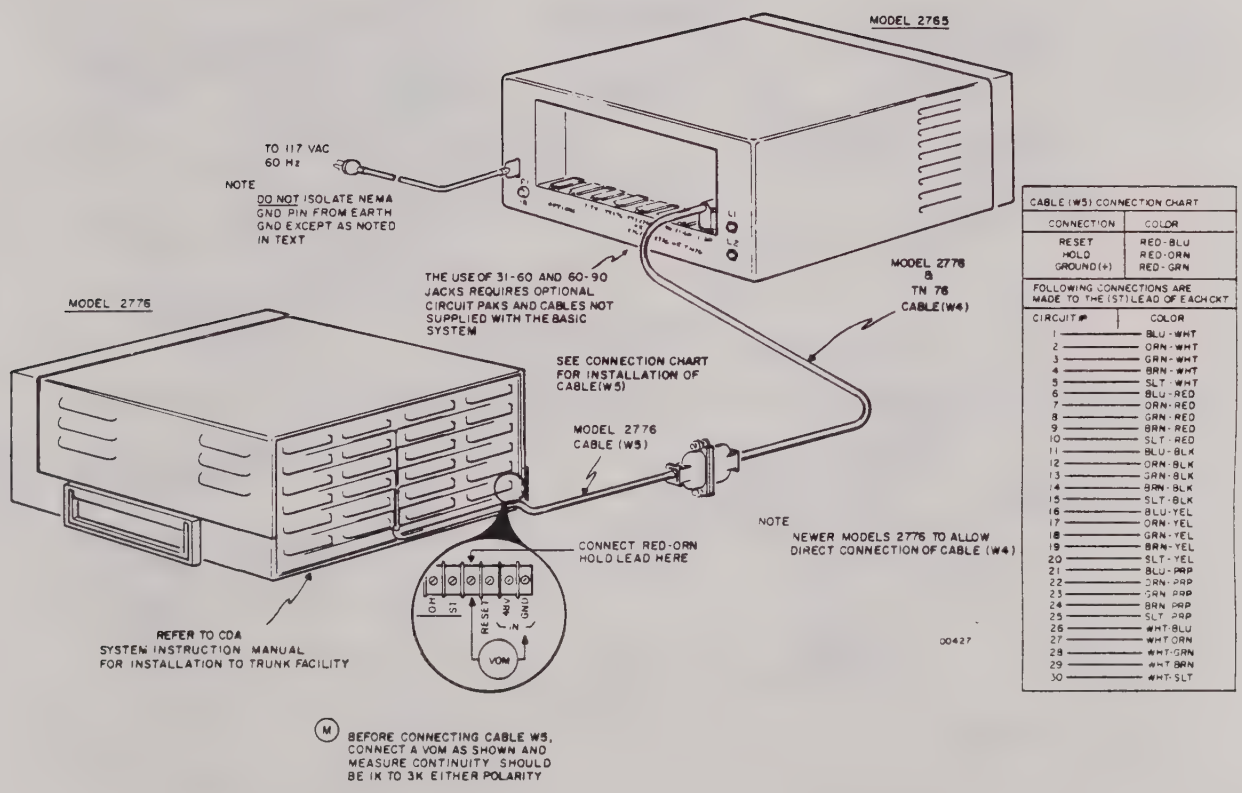


Figure 3—8. Model 2765, Installation Diagram for Connection with Model 2776.

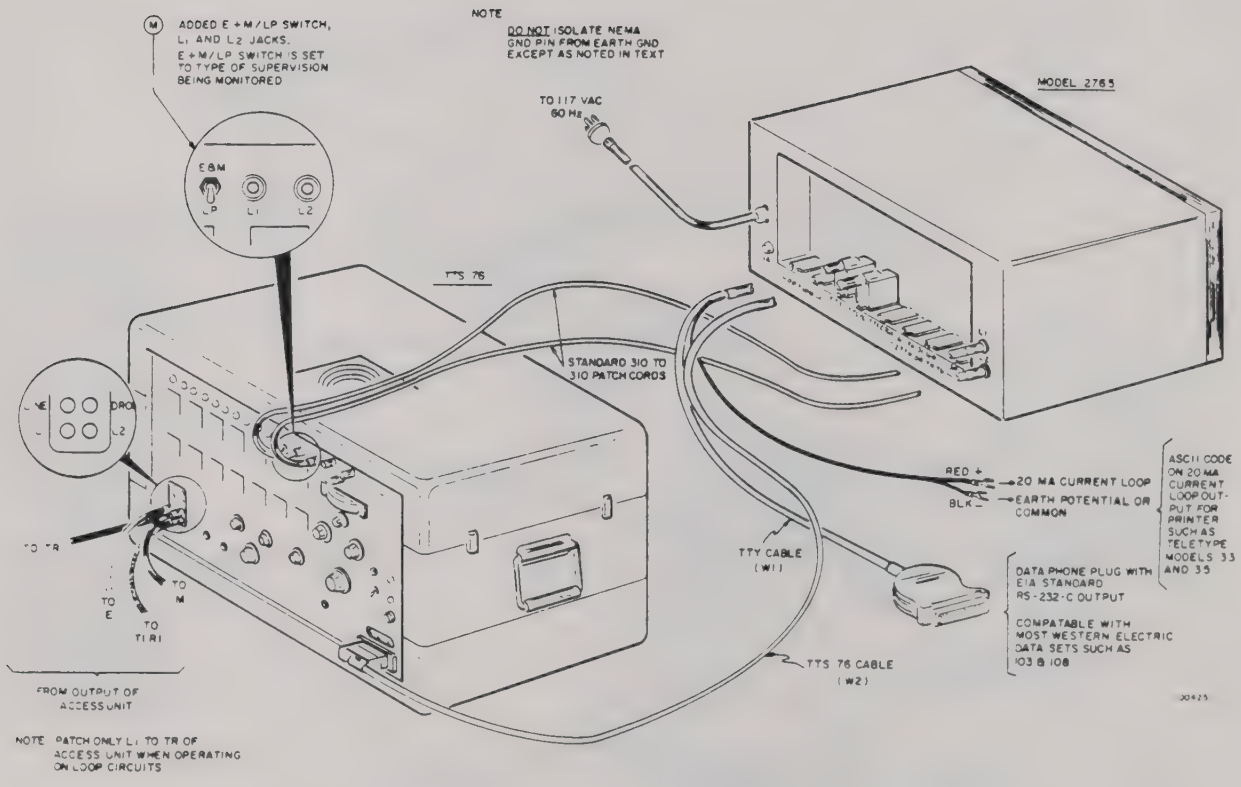

M
ADDED E + M/LP SWITCH, L1 AND L2 JACKS. E + M/LP SWITCH IS SET TO TYPE OF SUPERVISION BEING MONITORED
NOTE
DO NOT ISOLATE NEMA GND PIN FROM EARTH GND EXCEPT AS NOTED IN TEXT
TO 117 VAC 60 Hz
MODEL 2765
E&M
LP
L1
L2
TTS 76
STANDARD 310 TO 310 PATCH CORDS
RED +
BLK –
20 MA CURRENT LOOP
EARTH POTENTIAL OR COMMON
ASCII CODE ON 20 MA CURRENT LOOP OUTPUT FOR PRINTER SUCH AS TELETYPE MODELS 33 AND 35
TO TR
TO E
TO M
TO TI RI
TTY CABLE (W1)
DATA PHONE PLUG WITH EIA STANDARD RS-232-C OUTPUT
COMPATABLE WITH MOST WESTERN ELECTRIC DATA SETS SUCH AS 103 & 108
TTS 76 CABLE (W2)
FROM OUTPUT OF ACCESS UNIT
NOTE PATCH ONLY L1 TO TR OF ACCESS UNIT WHEN OPERATING ON LOOP CIRCUITS

Figure 3—9. Model 2765, Installation Diagram for Connection with Model TTS 76.

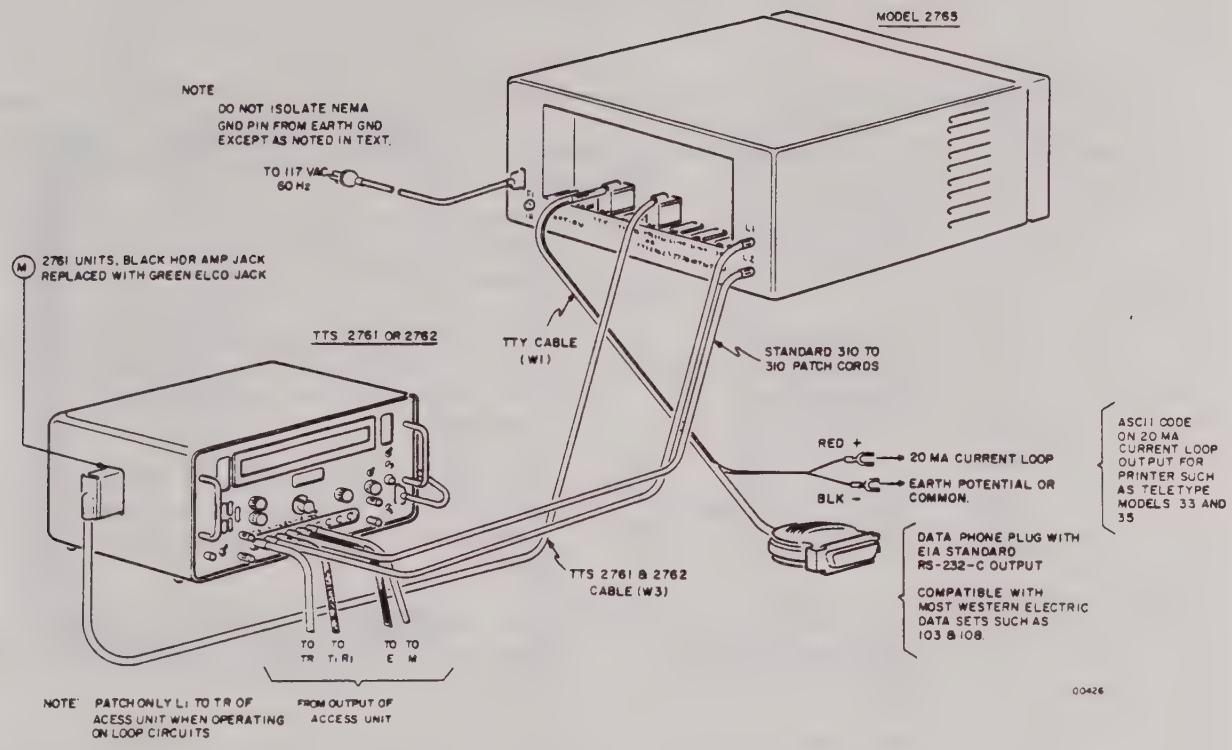

MODEL 2765
NOTE
DO NOT ISOLATE NEMA GND PIN FROM EARTH GND EXCEPT AS NOTED IN TEXT.
TO 117 VAC 60 Hz
2761 UNITS, BLACK HDR AMP JACK REPLACED WITH GREEN ELCO JACK
TTS 2761 OR 2762
TTY CABLE (W1)
STANDARD 310 TO 310 PATCH CORDS
RED +
20 MA CURRENT LOOP
EARTH POTENTIAL OR COMMON.
BLK –
ASCII CODE ON 20 MA CURRENT LOOP OUTPUT FOR PRINTER SUCH AS TELETYPE MODELS 33 AND 35
DATA PHONE PLUG WITH EIA STANDARD RS-232-C OUTPUT
COMPATIBLE WITH MOST WESTERN ELECTRIC DATA SETS SUCH AS 103 & 108.
TTS 2761 & 2762 CABLE (W3)
TO TR
TO T1 R1
TO E
TO M
NOTE: PATCH ONLY L1 TO TR OF ACESS UNIT WHEN OPERATING ON LOOP CIRCUITS
FROM OUTPUT OF ACCESS UNIT
00426

Figure 3–10. Model 2765, Installation Diagram for Connection with Models TTS 2761 or TTS 2762.

3.16 OPERATION.

3.17 The following includes operation of the Model 2765 unit only. For operation of the CDA System refer to the CDA System instruction manual.

3.18 Table 3–3 describes all operating controls and indicators as shown in Figure 3–11, Front Panel Controls and Indicators.

Table 3–3. Front Panel Controls and Indicators.

Index No.	Control or Indicator	Function
1	01 TOTAL counter	When inhibit lamp is lit, registers the total number of completed calls (01) observed while in the 01 OUTPUT INHIBIT mode.
2	24 HOUR CLOCK HRS and MIN digital switches	Used to program the correct time of day based on a 24 hour clock. *Example:* *8:15 AM set as 08 15* *1:18 PM set as 13 18*
3	SET CLOCK switch	If CIRCUIT ACCESS lamp is extinguished, it programs time indicated on HRS and MIN digital switches, prepares 2765 to forward this data to the printer for printout

Table 3–3 (cont)

Index No.	Control or Indicator	Function
4	SET CLOCK lamp	Serves as a set clock reminder after initial power-up. Lamp flashes until 24 HOUR CLOCK is set by depressing SET CLOCK switch.
5	T1, 08/06, DISPOSITION TIMER digital switch	On a high and dry, circuit determines amount of time in seconds after receipt of last dialed digit that a calling party disconnect will be recognized as a Call Abandoned.
6	T2, 08/04, DISPOSITION TIMER digital switch	Providing audible ringing tone is detected, determines amount of time after receipt of last dialed digit that a calling party disconnect will be recognized as a Call Abandoned.
7	T3, TERM, DISPOSITION TIMER digital switch	Determines amount of time after receipt of the last dialed digit that the system will observe a trunk before determining trunk disposition.
8	SET TIME switch	If CIRCUIT ACCESS lamp is extinguished, it programs times set on T1, T2, & T3 digital switches and prepares 2765 to forward this data to the printer for printout.
9	CIRCUIT ACCESS lamp	Lights to indicate a trunk access and Model 2765 is accepting data.
10	RUN/IDLE switch	IDLE position places the system in standby and will not accept data. RUN position places unit in operation ready to accept data.
11	POWER lamp	Lights to indicate unit is powered-up.
12	POWER switch	Applies 115V AC, 60 Hz to Model 2765 power supply
13	01 OUTPUT INHIBIT PUSH ON/OFF switch	When CIRCUIT ACCESS lamp is extinguished, inhibits printout of 01 Completed calls and activates 01 TOTAL counter for a running total of these calls; prepares 2765 to forward this data to the printer for printout
14	INHIBIT lamp	Lights to indicate completed call data is inhibited and 01 TOTAL counter is activated.

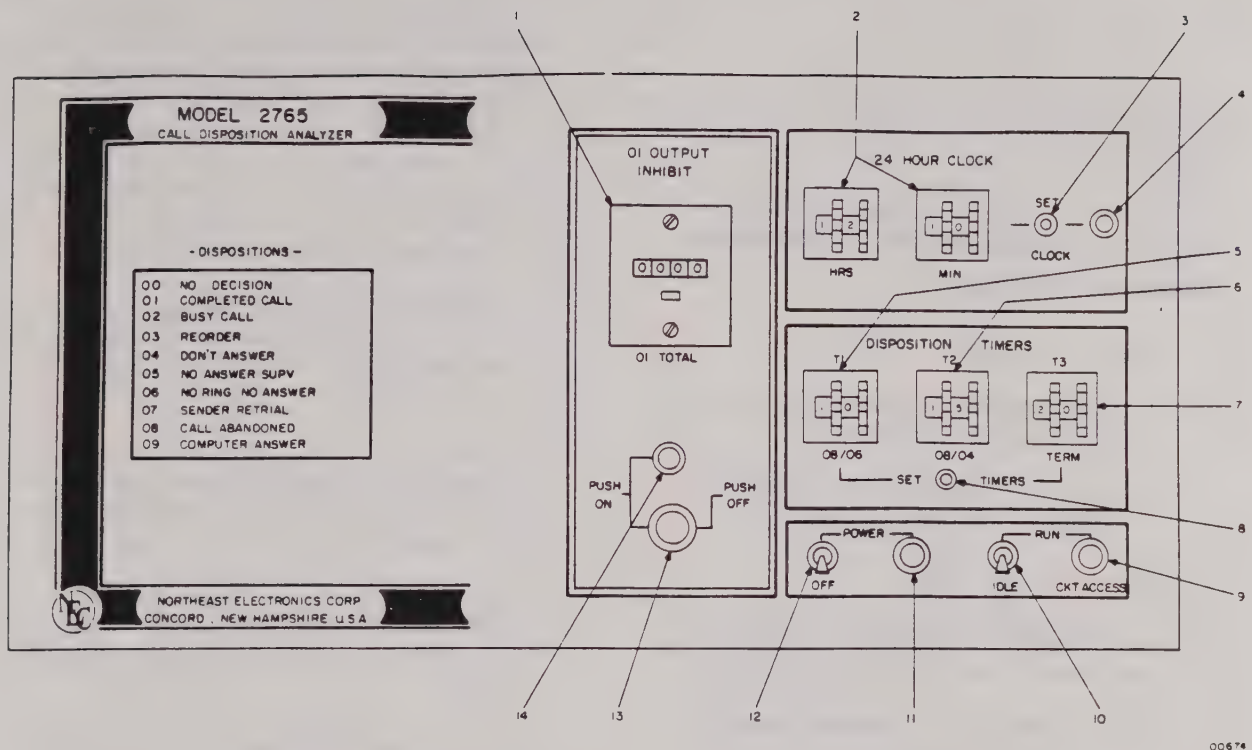


Figure 3—11. Model 2765, Front Panel Controls and Indicators.

3.19 OPERATION OF TIMERS.

3.20 The Model 2765 uses the time frame programmed into timers T1,T2, and T3 along with conditions monitored on a trunk to determine 04 Don't Answer, 06 No Ring, No Answer, or 08 Call Abandon disposition.

3.21 The following provides a detailed description of the conditions the Model 2765 seeks in order to determine 04,06, and 08 dispositions. Figures 3—12 through 3—14 provide graphic representations for quick reference. The times in seconds on the graphs for T1,T2, and T3 show time association and should not be interpreted as typical time settings used. EOD shown in Figures 3—12 through 3—14 indicates end of last digit dialed.

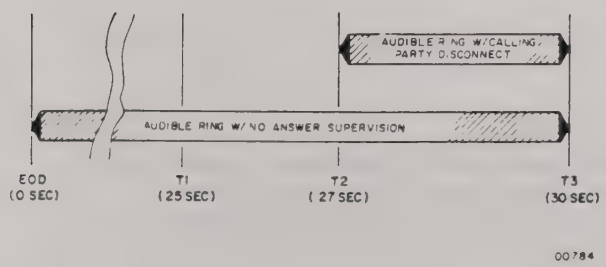


Figure 3—12. Model 2765, 04 Don't Answer Disposition Conditions.

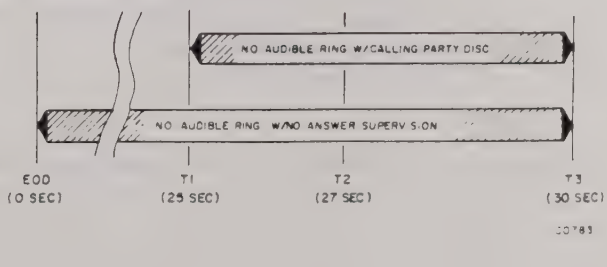


Figure 3—13. Model 2765, 06 No Ring, No Answer, Disposition Conditions.

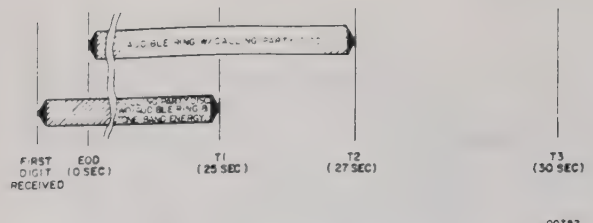


Figure 3—14. Model 2765, 08 Call Abandoned Disposition Conditions.

a. 04 Don't Answer:

1. Audible ringing tone detected and calling party disconnects after time T2, or . . . .

2. Audible ringing tone detected and time T3 elapses without answer supervision.

b. 06 No Ring, No Answer:

1. No audible ringing tone detected and calling party disconnects after time T1, or . . .

2. No audible ringing tone detected and time T3 elapses without answer supervision.

c. 08 Call Abandoned:

1. Audible ringing tone detected and calling party disconnects before time T2, or . . .

2. Neither audible ringing nor 120 milliseconds of tone-band energy detected and calling party disconnects after the first dialed digit, but before time T1.

NOTE

Tone-band energy is any voice, noise or tone signals detectable by the Model 2765 tones filter. For specifications as to what determines detection of tone band energy or audible ringing, see Section 2.

3.22 Timers T1,T2 and T3, start timing at end of last digit dialed (EOD). Therefore, time selected for the timers should be based on time from EOD. Because of variations in telephone systems, times allowable for T1, T2, and T3 should be based on the system to be monitored. This is to insure a valid representation of line activities monitored by the Model 2765. If service observing specifications are not available for the system monitored, time data from random sampling of calls should be taken to determine the following:

a. Amount of time (T1) allowable from EOD before an 08 Call Abandoned disposition is determined (audible ring not detected and calling party disconnects).

b. Amount of time (T2) allowable from EOD before an 08 Call Abandoned disposition is determined (audible ring detected and calling party disconnects).

c. Amount of time (T3) allowable from EOD before an 06 No ring, No Answer disposition is determined (no audible ring or answer supervision detected)

3.23 The Model 2765 depends on a trunk access unit and display unit for its data concerning trunk activity. A printer can be used to convert the Model 2765 output to readable hard copy. In the following description of results when initiating actions in setting up the Model 2765, it will be assumed that a printer has been connected to the data output.At this point it will be assumed that the access unit, display unit, and printer are powered up and functioning properly. (For complete system operation, refer to the CDA System instruction manual.)

3.24 Set up the Model 2765 Call Disposition Analyzer for proper operation using the following actions:

ACTION	RESULT
a. Set RUN/IDLE switch to IDLE position.	
b. Set POWER switch to ON position.	POWER lamp lights. SET CLOCK lamp flashes. Disposition timers are programmed to times set on T1, T2, and T3 switches. 24 hour clock is reset to zero. Printer receives an end of line routine (EOL) consisting of the following non printing character: X – OFF CR RO LF RO RO.
c. Set HRS and MIN digital switches to correct time of day based on a 24 hour clock. *Example:* *SET* *TIME HR. MIN* *9:30 AM 09 30* *1:18 PM 13 18*	
*d. Momentarily depress SET CLOCK switch.	Programs clock to time set on HRS and MIN digital switches. SET CLOCK lamp stops flashing and remains extinguished. Printer receives and prints time data: *Example: 0930* Then printer receives EOL.
e. If disposition times programmed upon power up are not desired, set T1, T2, and T3 to the desired times.	
*f. Momentarily depress SET TIME switch.	Programs times set on T1, T2, and T3. New times data forwarded to printer. Printer receives and prints programmed times: *Example: T1 = 25 T2 = 27 T3 = 30* Then printer receives EOL.
*g. If completed call data to printer is to be inhibited, momentarily depress 01 INHIBIT switch.	01 INHIBIT lamp lights. Printout of completed call 01 TOTAL counter keeps count of all completed calls during this mode of operation. Printer prints: 01 INH Then printer receives EOL.
h. Set RUN/IDLE switch to RUN position.	Circuit Access Lamp lights with next accessed trunk then trunk observation begins.

* **NOTE: When the system is in the RUN mode of operation, the SET CLOCK, SET TIME and 01 INHIBIT switch will initiate their function only during a time the system is not observing a trunk (circuit access lamp not lit).**

3.25 When a trunk is accessed and the RUN/IDLE switch is set to the IDLE position, the call observation will be terminated; the printer will receive an end of line (EOL) routine.

3.26 If the system is accessed for more than 5 to 6 minutes, the printer will receive an EOL routine and the system will reset itself.

3.27 The Model 2765 analyzes the activity on a monitored trunk, then forwards resulting data to the printer.

3.28 **PRINTOUT INTERPRETATION.**

3.29 Data appearing in the printout when the system has accessed a trunk, as indicated by the lit ACCESS lamp, is broken down into five groups as shown in the examples below.

Examples:

a.	*0930*	*01*	*L*		*6032247466*		**01*
b.	*1318*	*05*	*L*	*K1*	*6032247466*	*S*	**05*
c.	*2016*	*03*	*E*	*K1*	*6032247466*	*S*	**01*
Grp.	*1*	*2*	*3*		*4*		*5*

3.30 The examples above show some of the different printout possiblities. The five groups as shown in example a., above gives 9:30 A.M. (0930) as the time of seizure on trunk number one (01). The supervision was loop (L), the number (address) was 603 224 7466 loop dial pulsed. Loop dial pulse is indicated by the absence of MF codes preceding and following the address. The call disposition, represented by 01 in the fifth group, identifies a Completed Call.

3.31 In example b. above, 1:18PM (1318) is time of seizure on trunk number five (05). Supervision was loop (L), address was 603 224 7466 MF signaling as indicated by MF codes K1 and S preceding and following the address, respectively. K1 is an abbreviation of KP1. If the Model 2762 MF Loop Signaling Display unit is used in a system, MF codes KP2, CD11, or CD12 could also be detected instead of KP1. KP2, CD11, and CD12 would appear in the printout as K2, C1, and C2, respectively. Refer to Tabe 3—5 for explanation of MF signaling codes and digits recognized by the TTS 2762. The call disposition represented by 05 in example b., identifies a No Answer disposition.

3.32 In example c., above, 8:16 P.M. (2016) is time of seizure on trunk number three (03). Supervision on E lead identifying an incoming call monitored on L1 of Model 2765. Address was 603 224 7466 MF signaling. Call disposition is 01, Completed Call. Refer to Table 3—4 for a list of possible printout data with interpretation appearing in each group previously mentioned in paragraph 3.29.

Table 3—4. Printout Interpretation.

Group No.	Printout	Interpretation
1	XXXX	Time of Trunk Seizure. (24 hour clock)
2	XX	Trunk Identification. 1 through 30 trunks, *31 through 60 trunks, *61 through 90 trunks
3		Originating Supervision.
	L	Loop circuit
	E	E lead seizure
	M	M lead seizure
	?	Could not recognize
4		Numbers (Address) Dialed or Pulsed.
	K1 (dialed digits) S K2 (dialed digits) S C1 (dialed digits) S C2 (dialed digits) S	Multi-frequency (MF) signaling **NOTE** **When using Model 2762 MF and Dial Pulse Display unit in the system, codes KP2 (K2), CD11 (C1), and CD12 (C2) will be detected.**
	Dialed Digits	Dial pulse signaling.
5		Call Disposition
	00	No Decision: 120 msec tone-band energy detected, but unable to recognize as valid disposition, and calling party disconnects before T1, or no dialing received after 31 to 32 seconds waiting period. **NOTE** **Tone-band energy is any voice noise, or tone signals detectable by Model 2765 tone filters.** (See specifications in section 2).
	01	Completed Call: Detected answer supervision on loop circuit (line reversal) or OFF-HOOK on both E and M leads.
	02	Busy Call: Detected busy tone such as 480 Hz plus 620 Hz at 60 IPM (Refer to section 2 for busy detection conditions.)
	03	Reorder: Detected reorder tone such as 480 Hz plus 620 Hz at 120 IPM (Refer to section 2 for reorder detection conditions.)
	04	Don't Answer: Detected audible ring such as 440 Hz plus 480 Hz tone, 1 second on, 3 seconds off, and calling party disconnects after time T2 or, T3 times out with audible ring detected and no answer supervision.
	05	No Answer Supervision: Audible ring detected, ringing stopped for 7 to 8 seconds with no answer supervision, and tone-band energy detected.

Table 3—4 (cont)

Group No.	Printout	Interpretation
5 (cont)	06	No Ring, No Answer: No audible ring detected and calling party disconnects after time T1 or, T3 times out without detecting audible ring or answer supervision.
	07	Sender Retrial: Detection of simultaneous off hook or on hook conditions on E and M leads before 5 seconds elapse after seizure.
	08	Call Abandoned: Audible ring detected, calling party disconnects between EOD and time T2 or, no tone-band energy detected and calling party disconnects between receipt of first dialed digit and time T1.
	09	*Computer Answered: Proper answer supervision with echo suppressor 2150 Hz disabling tone detection.
	10	*Blue Box: Detection of a continuous 2600 Hz tone equal to, or greater than, 150 msec after EOD, but before recognizition of any other call disposition *NOTE: Optional feature not included with the basic unit.

Table 3—5. Multifrequency Signaling Recognized by the TTS 2762.

Digit	Frequencies (Hz)
1	700 + 900
2	700 + 1100
3	900 + 1100
4	700 + 1300
5	900 + 1300
6	1100 + 1300
7	700 + 1500
8	900 + 1500
9	1100 + 1500
0	1300 + 1500

Code	Frequencies (Hz)	Explanation	System
KP	1100 + 1700	Prep. for digits	
Coin Return	1100 + 1700	Coin Return	Coin Control
KP1	1100 + 1700	Terminal Call	CCITT #5
ST	1500 + 1700	End of Pulsing Seq.	
STP	900 + 1700		TSPS
CD12	900 + 1700	Delay Operator	CCITT #5
ST2P	1300 + 1700		TSPS
KP2	1300 + 1700	Transit Call	CCITT #5
ST3P	700 + 1700		TSPS
Ringback	700 + 1700	Ringback	Coin Control
CD11	700 + 1700	Inward Operator	CCITT #5
Coin Collect	700 + 1100	Coin Collect	Coin Control

SECTION 4

CIRCUIT DESCRIPTION

4.1 INTRODUCTION.

4.2 This section provides the following:

a. Block diagram level description of the Call Disposition Analyzer (CDA) System to show relationship of Model 2765 with other units in the CDA System.

b. Overall block diagram level description of the Model 2765.

c. A description of the format in which data is processed.

d. Functional block diagram level description based on activity during signal processing associated with each address written on the Function Address Bus in the Model 2765 unit.

4.3 At the end of this section several tables are provided for reference. Three tables cover activity on several buses during processing of a Call Complete (01) disposition, time of day printout, and disposition timers printout. Also provided is a table showing programming of programmable read only memory U6 used in a basic Model 2765 unit and a table of the ASCII code.

4.4 CDA SYSTEM BLOCK DIAGRAM DESCRIPTION.

4.5 Referring to Figure 4–1, in the CDA System, the interface to office trunk equipment is provided by the trunk access unit (Model 2776 or TN 76). Upon recognition of a trunk seizure the trunk access unit allows bridging of the TR, T1, R1, L, and M leads of the seized trunk by the signal display unit (TTS 76, 2761, or 2762) and Model 2765. At the same time, it supplies the Model 2765 with the trunk number. Now the Model 2765 performs the following functions simultaneously:

a. Generates a hold control command which is routed to the access unit. It prevents a reseizure prior to determination of call disposition and. . .

b. Provides time of day and trunk number data on its output to the printer and/or data set.

4.6 Any signaling appearing on the bridged trunk and recognized by the signal display unit is processed, displayed, and routed to the Model 2765. The processed signaling routed to the Model 2765 includes codes, MF or dial pulsing, and supervision information. This information is processed by the Model 2765 and appears at its data output when it is received from the signal display unit.

4.7 Upon recognition of end of dialing (EOD) on the bridged trunk, the Model 2765 monitors the TR (L1 for E or S lead seized trunk) or the T1 R1 (L2 for M lead seized trunk) for audible tones from the called office.

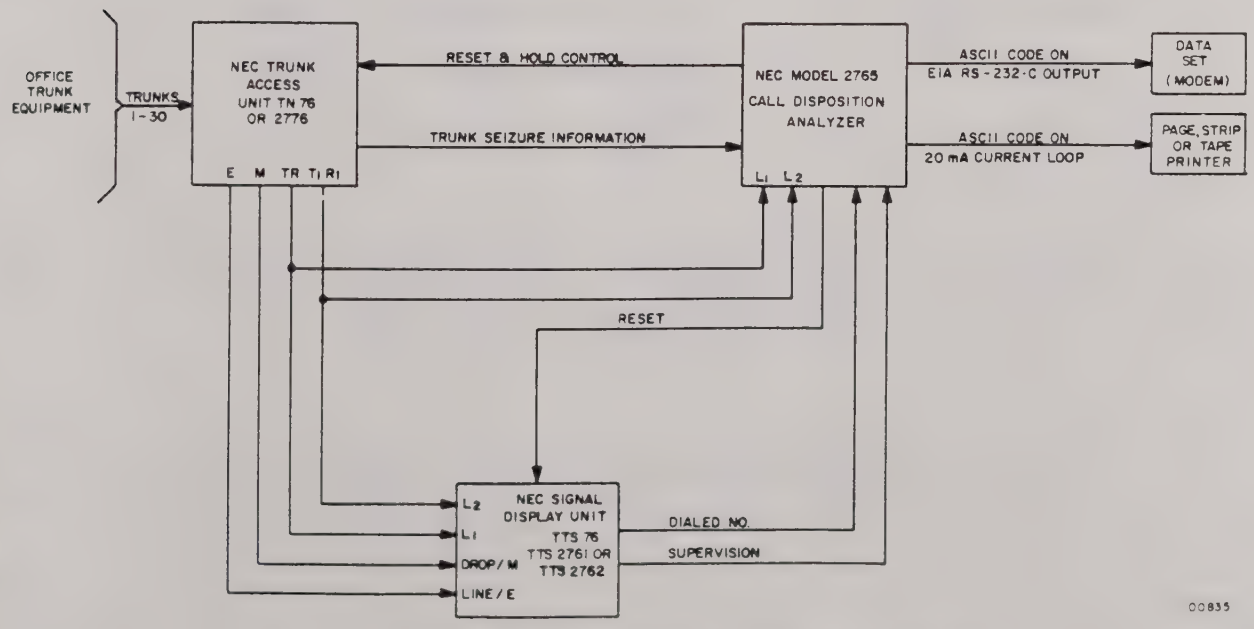


Figure 4–1. Model 2765, Block Diagram of Basic CDA System.

4.8 The Model 2765 analyzes information provided by the trunk access and signal display units, audible tones monitored on L1 and L2, and internal timing to determine a call disposition. The disposition is then routed to the printer and/or data set.

4.9 MODEL 2765.

4.10 Referring to Figure 4–2, the Model 2765 is designed around a TTL open collector bus structure. Generally, any printed circuit board (pcb) in the unit having data for the ASCII Bus lines will write it on the bus when addressed by the four line binary Function Address Bus (FAB). If an addressed pcb has data, it will provide a data ready command on the $\overline{\text{DRDY}}$ bus. The $\overline{\text{DRDY}}$ command causes data on the ASCII Bus to be entered into the first-in first-out (FIFO) memory circuit of the data control pcb A1A17. Pcb A1A17 then generates a pulse on the Data Entered ($\overline{\text{DE}}$) bus. This causes the address control pcb A1A15 to change address on the Function Address bus. The above described cycle will continue until each pcb addressed has provided its data to the FIFO. Data is transferred out of the FIFO serially at a fixed rate of 110 baud.

4.11 Printed circuit boards A1A2, A8, A10, A12, and options pcb A1A4 and A6 are interface cards for the trunk access, display, and printer peripheral equipment. When addressed, pcb A1A3, A5, A7, and A11 latch the data provided by the peripheral equipment and write it on the ASCII Bus. Pcb A1A13, A15, and A17 control addressing, store data, and provide special signals for data control.

4.12 Printed circuit boards A1A14, A16, and A18 process analog signals on telephone transmission lines being observed via inputs L1 and L2 (A1A33J1 and J2, respectively). Digital Timers pcb A1A20 and A22 detect a busy reorder disposition for high or low level supervisory tones appearing on L1 and L2 inputs. Print Control pcb A1A23 and Disposition Timers pcb A1A25 control the disposition timers T1, T2, and T3. Pcb A1A23 also controls printout of time and the timers when they are set from front panel controls. The 01 inhibit control, pcb A1A19, serves to interface the inhibit controls and counter of the 01 INHIBIT module with other circuitry in the Model 2765.

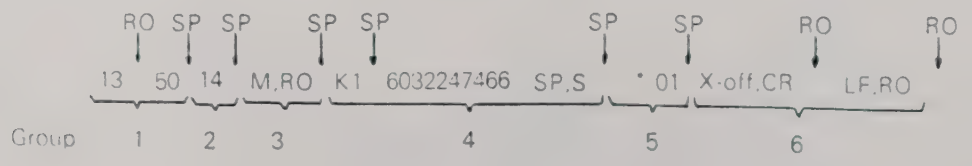
4.13 Optional pcb A19 and A21 provide data storage and a general sort of this data. These printed circuit boards, along with a front panel module, comprise Option A of the Model 2765. When used, they replace A1A19 and its associated 01 INHIBIT front panel module supplied with the basic unit.

4.14 DATA OUTPUT FORMAT.

4.15 The Model 2765 processes its data in a six data group sequence incorporating a two character block format. The first five groups can appear in a hard copy printout. The sixth group contains printer control characters that are not printable. The example below provides a typical line of data, the same used in the following functional block diagram descriptions.

Example:	**1350**	**14**	**M**	**K1 6032247466 S**	*** 01**	**CR LF**
Group	1	2	3	4	5	6
	Time Print	Circuit No.	Supervision	Dialed No.	Disposition	End of Line Routine

4.16 With the exception of the dialed digits in data group 4 and the asterisk at the end of this group, all information is presented in two character blocks separated by a space (SP) or rub out (RO). Therefore, the above line of data contains the following characters



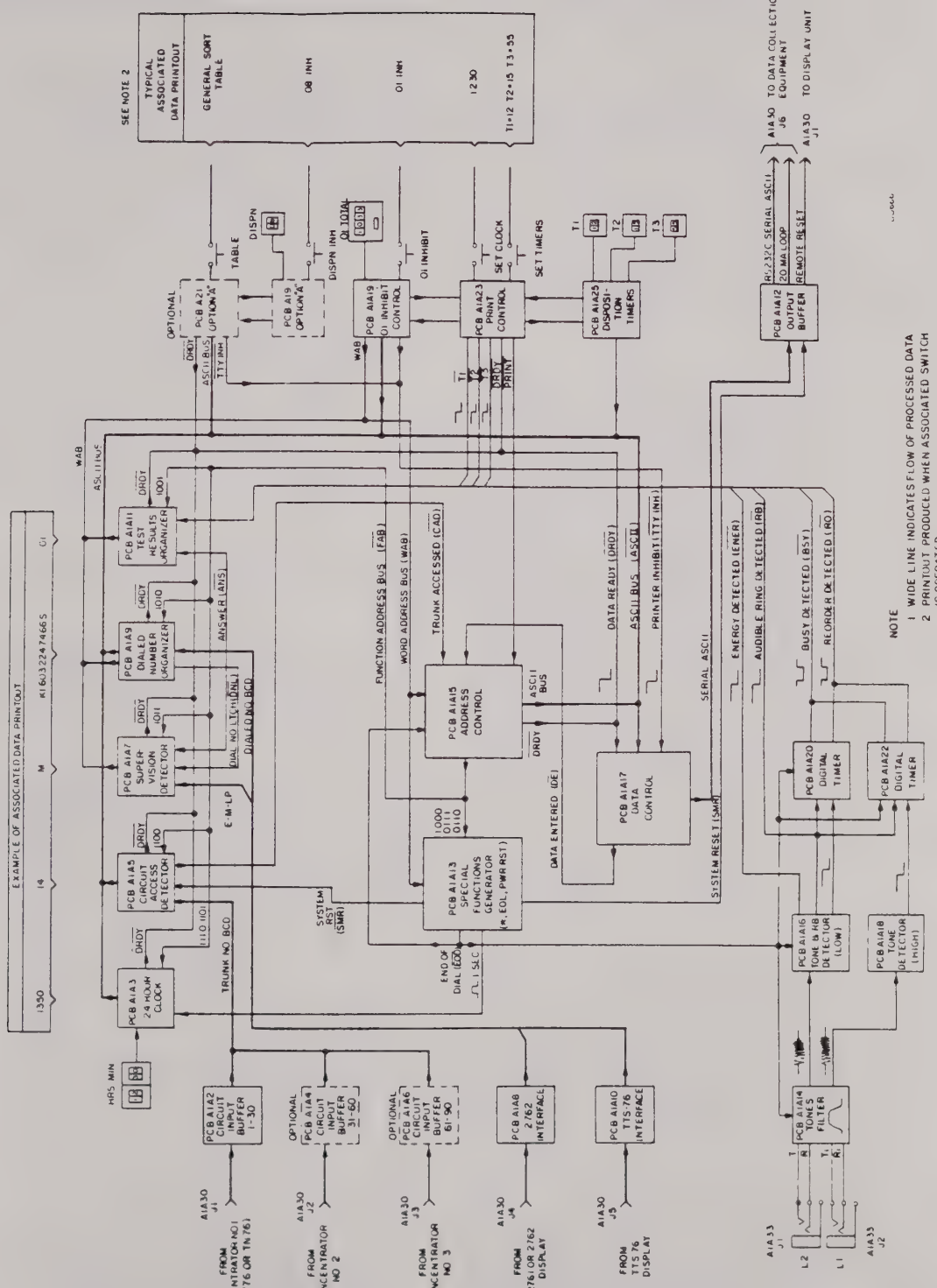


Figure 4—2. Model 2765, Overall Block Diagram.

4.17 The Function Address Bus in Model 2765 provides addresses that enable data to appear on its ASCII Bus following the two character format mentioned above. The following shows the address numbers and the data that they would cause to appear on the ASCII Bus using the line of data given below:

Data	13	50	29	E,RO	K1	6032247466	SP,S	* 01	X-OFF,CR	LF,RO
Address No.	1	2	3	4	5	5	5	6	7	8

4.18 Possible Data Outputs. The following provides possible data that could exist in each group mentioned in paragraph 4.16:

1	2	3	4			5	6
00	00	01	E	K1	123456789	* 00	End of Line
			M	K2			
			L	C1	?		
			?	C2			
23	59	90		1234567890	1234567	* 10	

a. Group 1 is a time print based on a 24 hour clock.

b. Group 2 is circuit number information and may be any number from 1 through 90.

c. Group 3 will always be one of four characters, E, M, L or ?.

d. Group 4 contains two categories of information:

1. The first is code tone recognition. They can be K1,K2,C1,C2, or S and ?. They can be recognized anywhere in the dialed no. group, i.e., before, during, or after the dialed digits. Two exceptions are S and ?. Upon recognition of one of these two characters, data group 4 will terminate and no other data will appear in that group.

2. The second category of information in data group 4 is dialed digits. They can be any combination of 0-9 with a total possibility of 28 digits. In case of no code tone recognition, data group 4 will be terminated with an asterisk immediately following the last dialed digit

e. Group 5 is the call disposition print and can be digits 00 through 10

f. Group 6 is end of line information to a printer Normally it occurs after group 5 and terminates a line of data, but it can occur anytime during a line of data.

4.19 Other Possible Data. Three other lines of data are possible for printout from the CDA System. Thesee lines are a result from setting the front panel controls of the Model 2765. They are as follows:

a. T1 = 00 (SP) 99 T2 = 00 (SP) 99 T3 = 00 (SP) 99 End of Line

In this output each group can vary from 00 through 99.

b. 23 (RO) 31 (SP) End of Line

This is a time print as a result of setting the 24 hour clock.

c. 01 (SP) 1NH (No SP) End of Line

The characters in this printout will not change For complete data interpretation refer to Section Three. paragraphs 3.28 through 3.32 and Table 3–4

4.20 FUNCTIONAL BLOCK DIAGRAM DESCRIPTION.

4.21 In the Model 2765 the Address Control printed circuit board A1A15 writes addresses one through nine on the Function Address Bus. Addresses one through six causes data related to the call under observation to appear on the ASCII Bus. Addresses seven and eight cause printer control commands to appear on the ASCII Bus. Address nine resets the Model 2765 circuitry and provides reset commands for the trunk access and signal display units used in the CDA System.

4.22 In the following functional block diagram level discussions, it will be assumed that the 24 hour clock has been set, the unit is not operating in the 01 inhibit mode, and the following data is being processed:

a. Time of trunk access is 1350.

b. Trunk number supplied by trunk access unit is 14.

c. E and M supervision is monitored with originating supervision on the M lead.

d. MF signaling is monitored with dialed numbers (address) 6032247466.

e. The call is completed.

4.23 ADDRESSES ONE AND TWO.

4.24 Referring to Figures 4–3 and 4–4, assume that voltage on ST lead representing circuit number 14 from a trunk access unit goes from –48 volts to 0 volts. This is routed to Circuit Input Buffer pcb A1A2 via input jack A1A30J1 where it is encoded to a binary coded decimal (bcd) FORMAT. The Circuit Access Detector pcb A1A5 receives this data. If the data is present for more than approximately 140 milliseconds. $\overline{CAD}$ output of pcb A1A5 is brought LO. This verifies that a circuit access has been detected. The bcd data representing circuit number one is latched and stored on pcb A1A15 until the third address.

4.25 When $\overline{CAD}$ bus went LO, it placed a bit into the subroutine ring counter (U4 and U5) of the Address Control pcb A1A15. This sets U4A of the ring counter, causing address one to appear on the Function Address Bus (FAB) via Address Counter U8 on pcb A1A15. The 24 Hour Clock pcb A1A3 reads the address and writes the most significant digit (msd) of the hours on the ASCII Bus. Simultaneously, $\overline{DRDY}$ output of pcb A1A3 is driven LO and routed to the Data Control pcb A1A17. The $\overline{DRDY}$ input enables msd data on the ASCII Bus to be shifted into the first-in first-out memory (FIFO). As data is shifted into the FIFO, a $\overline{OE}$ is generated by the Shift In Control on pcb A1A17 and is routed to pcb A1A15. The msd data is then shifted out of the FIFO. If the unit were in the 01 inhibit mode of operation, the FIFO would store data until a call disposition is determined.

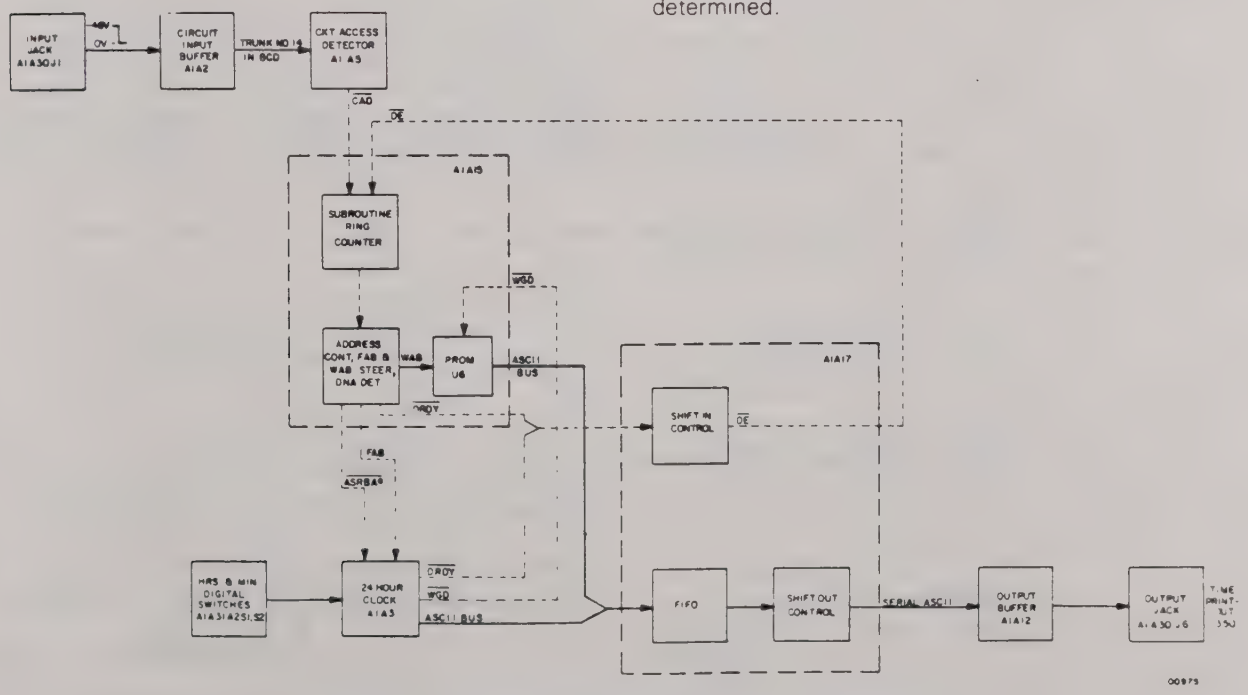


Figure 4–3. Model 2765, Block Diagram of Address One and Two Time Data Processing.

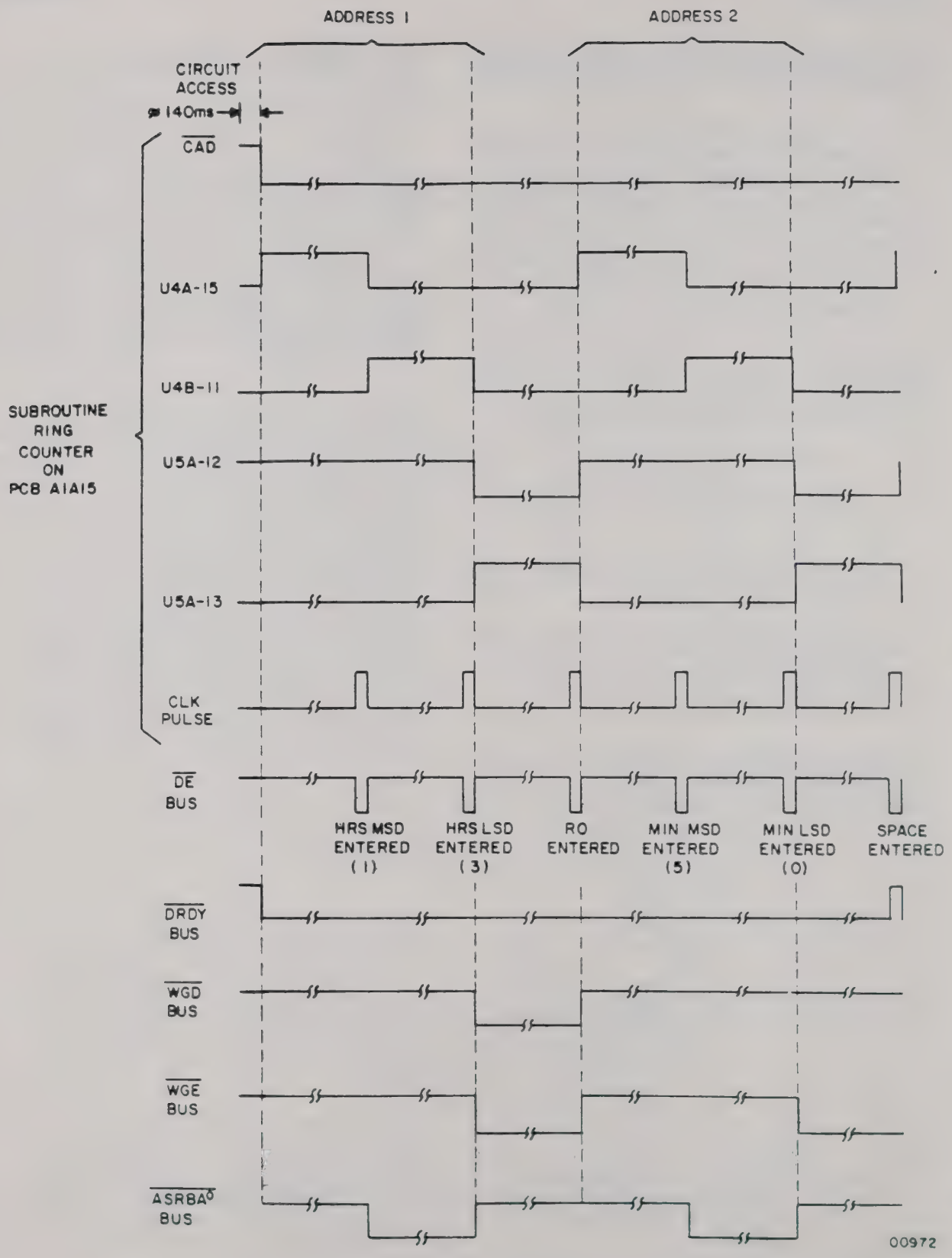


Figure 4—4. Model 2765, Address One and Two Synchrogram.

4.26 The msd of hours is shifted out serially by the Shift Out Control on pcb A1A17. The serial ASCII data is routed to the output jack A1A30J3 via Output Buffer pcb A1A12.

4.27 The $\overline{DE}$ output from pcb A1A17 shifts the bit in the Subroutine Ring Counter on pcb A1A15 (U4B set - U4A reset). This causes the address subroutine bus ASRB A° to go LO, enabling the 24 Hour Clock pcb A1A3 to write the least significant digit (lsd) of hours on the ASCII Bus. The DRDY bus line is kept LO by pcb A1A3, allowing lsd data to be shifted into the FIFO. Shift In Control on pcb A1A17 provides another $\overline{DE}$ output.

4.28 The $\overline{DE}$ output shifts the ring counter bit on pcb A1A15 to its final position (U5A set - U4B reset). This causes the following on pcb A1A15:

a. Function Address Bus (FAB) and Word Address Bus (WAB) are inhibited, thus removing address one from the FAB.

b. $\overline{DRDY}$ bus is driven LO.

c. $\overline{WGE}$ bus is driven LO.

4.29 When address one is removed from FAB, pcb A1A3 drives word gate disable ($\overline{WGD}$) bus LO. This disables the programmable read only memory U6 on pcb A1A15 which was enabled by the $\overline{WGE}$ bus. Since $\overline{DRDY}$ is LO and there is no data condition on the ASCII bus, a delete or rub out is entered into the FIFO. The $\overline{DE}$ generated from entry of RO data into the FIFO shifts the ring counter bit on pcb A1A15 to its original position (U4A set - U5A reset). The $\overline{DE}$ pulse also drives output $\overline{WGD}$ HI on pcb A1A3. The ring counter clocks the Address Counter, causing address two to appear on FAB.

4.30 This address causes the 24 Hour Clock pcb A1A3 to write the minutes data on the ASCII Bus. The data is processed in the same two block character routine previously described for hours data.

4.31 When the least significant digit of minutes is entered into the FIFO, the $\overline{DE}$ generated enables pcb A1A15 as described in paragraph 4.28 above. Since the $\overline{WGE}$ is not LO this time, the PROM writes a space on the ASCII Bus. As the data for a space is entered into the FIFO, another $\overline{DE}$ pulse is generated, causing address three to appear on FAB.

4.32 **ADDRESS THREE.**

4.33 In address 3 the circuit number data is processed in the same two character format as described in addresses 1 and 2. Trunk numbers 1 through 9 are preceded by a zero in order to maintain the two character format.

4.34 Referring to Figure 4–5 and Figure 4–6, address 3 is written on the Function Address Bus (FAB) by Address Control pcb A1A15 and read by Circuit Access Detector pcb A1A5. Assume that trunk number 14 is stored on pcb A1A5. At this time pcb A1A5 writes the most significant digit (msd) 1 on the ASCII Bus. The $\overline{DRDY}$ bus is kept LO during this address by pcb A1A5. The LO $\overline{DRDY}$ allows the Shift In Control on pcb A1A17 to generate a $\overline{DE}$ while entering msd data into the FIFO on pcb A1A17. The msd of the trunk number (1) is now processed by the Shift Out Control to provide a serial ASCII output. This output is routed to output jack A1A30J6 via Output Buffer pcb A1A12.

4.35 When the msd data was entered into the FIFO, the $\overline{DE}$ generated causes the Subroutine Ring Counter on pcb A1A5 to shift its bit to the first position (U4B set - U4A reset). This in turn drives the address subroutine bus ASRB A° LO and enables Circuit Access Detector pcb A1A5 to write the least significant digit (lsd) of the trunk number on the ASCII Bus. In this case character 4 is written on the ASCII Bus.

4.36 As this data is entered into the FIFO, $\overline{DE}$ is generated by the Shift In Control. This steps the subroutine ring counter bit to its second position (U5A set - U4B reset). The Shift Out control processes lsd data, character 4, which is routed to output jack A1A30J6 via Output Buffer pcb A1A12.

4.37 Address Control pcb A1A15 removes address 3 from the Function Address Bus, drives ASRB A° output HI, keeps $\overline{DRDY}$ LO, and writes a space on the ASCII Bus. The $\overline{DE}$ generated while processing data on the ASCII Bus shifts the Subroutine Ring Counter to its original position (U4A set- U5A reset). This steps Address Counter on pcb A1A15 to address four.

4.38 **ADDRESS FOUR.**

4.39 The originating supervision data at address 4 is processed in the two character block format with a rub out (RO) or delete replacing one of the characters. In addition to address 4 information on the FAB, a dialed number latched ($\overline{DNL}$) command must be received before supervision data can be written on the ASCII Bus.

4.40 Address 4 appears on the Function Address Bus and is read by Supervision Detector pcb A1A7. This enables timer circuits, conditions logic gates, and drives $\overline{WGE}$ output LO on pcb A1A7. The $\overline{WGE}$ output is routed to Address Control pcb A1A15 where it

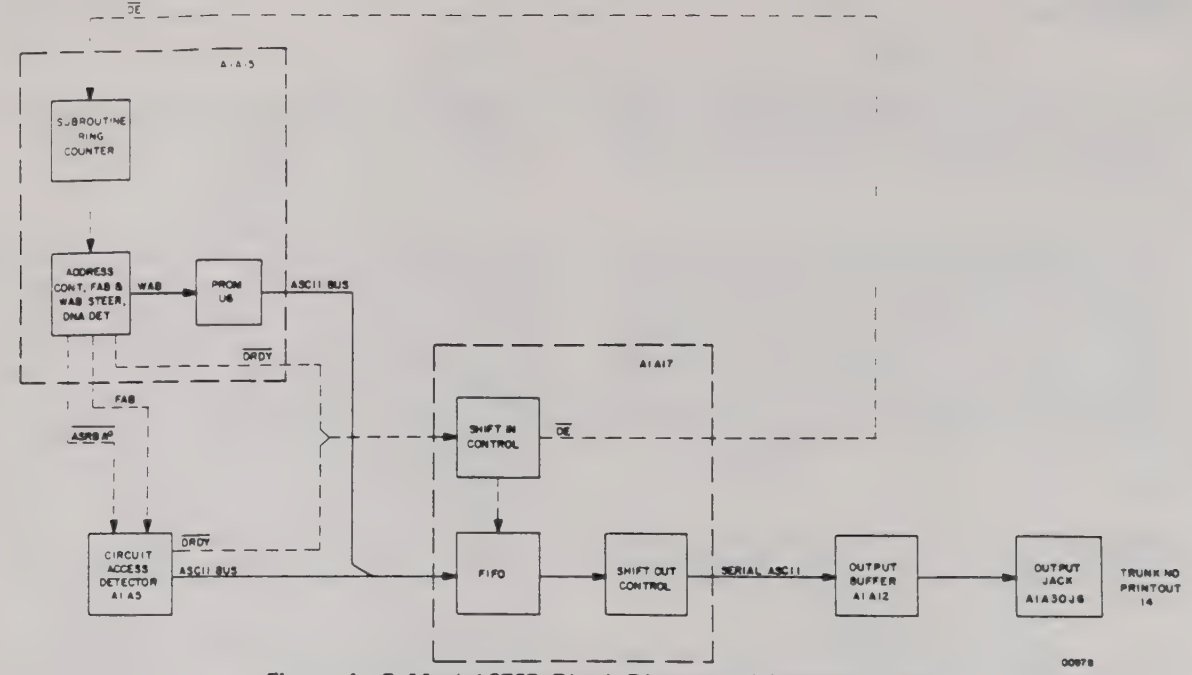


Figure 4—5. Model 2765, Block Diagram of Address Three Trunk Number Data Processing.

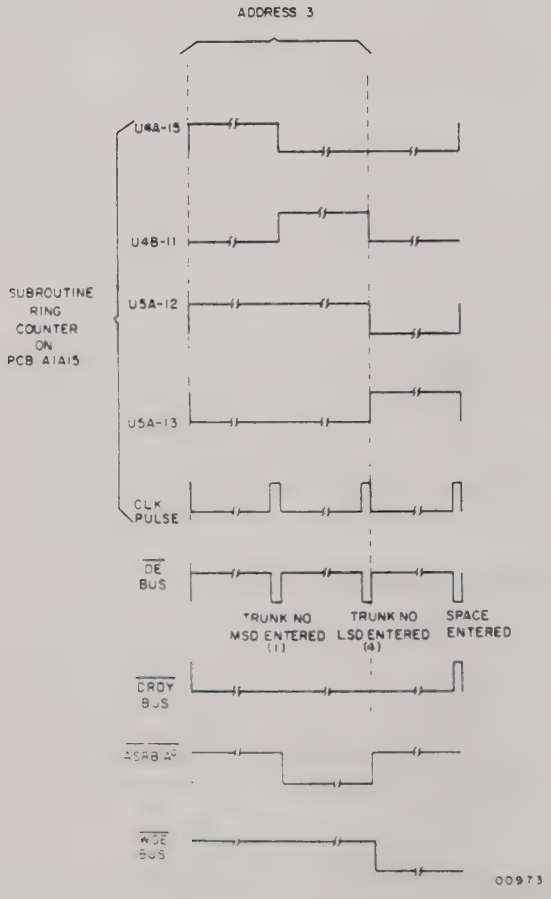


Figure 4—6. Model 2765, Address Three Synchrogram.

enables U6 programmable read only memory (PROM) to write data on the ASCII Bus. Refer to Tables 4—4 and 4—5 at the end of this section for PROM U6 programming and ASCII code interpretation. The Word Address Bus (WAB) determines the data provided by the PROM.

4.41 Assume originating supervision data (M lead) is received from a TTS 2762 display unit via input jack A1A30J4. It is routed to pcb A1A7 via the supervision lead buffer circuit on pcb A1A8. When the Dialed Number Organizer pcb A1A9 receives and latches dialed number information (code tone or dialed number) it drives its $\overline{DNL}$ output LO. $\overline{DNL}$ appears at input of originating Supervision Detector pcb A1A7 where the $\overline{DRDY}$ bus is driven LO and originating supervision data (M) is latched and written on the Word Address Bus

4.42 It should be noted that in this discussion it is assumed that the originating supervision data was received within approximately 30 seconds after address four appeared on the Function Address Bus. Otherwise, a 30 second timer on pcb A1A7 would time out and provide an output that results in a No Decision (00) disposition printout

4.43 Originating supervision data on the Word Address Bus is encoded to ASCII code by PROM U6 on pcb A1A15 and written on the ASCII Bus. $\overline{DRDY}$ enables Shift In Control to enter data into the FIFO on pcb A1A17. As data is being entered into the FIFO, the Shift In Control generates a $\overline{DE}$ output pulse. The Shift Out Control processes supervision data (M) to produce a serial ASCII output that is routed to output jack A1A30J6 via Output Buffer pcb A1A12

4.44 The $\overline{DE}$ pulse shifts the subroutine ring counter bit on pcb A1A15 to its first position (U4B set - U4A reset). This drives the address subroutine ASRB A° bus LO, which enables PROM U6 on pcb A1A15 to write a rub out (RO) on the ASCII Bus. This data is entered into the FIFO and another $\overline{DE}$ is generated. The data is then shifted out of the FIFO, processed to provide a serial ASCII and routed to output jack A1A30J6 via Output Buffer pcb A1A12. The RO is not printable but completes the two character format as far as the data collection equipment is concerned.

4.45 The $\overline{DE}$ generated when RO is entered into the FIFO shifts the ring counter bit on pcb A1A15 to its second position. Now address four is removed from the Function Address Bus by pcb A1A15. $\overline{DRDY}$ and $\overline{WGE}$ are kept LO and ASRB A° is driven HI by pcb A1A15 PROM U6 writes a space on the ASCII Bus. The $\overline{DE}$ from a space entered into the FIFO shifts the ring counter bit to its original position (U4A set - U5A reset). This clocks the Address Counter on pcb A1A15 to address five.

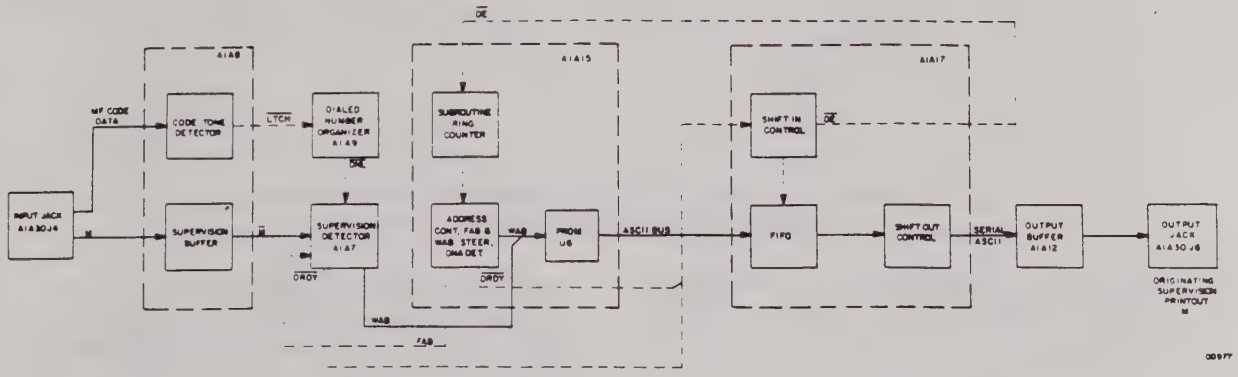


Figure 4—7. Model 2765, Block Diagram of Address Four Originating Supervision Data Processing.

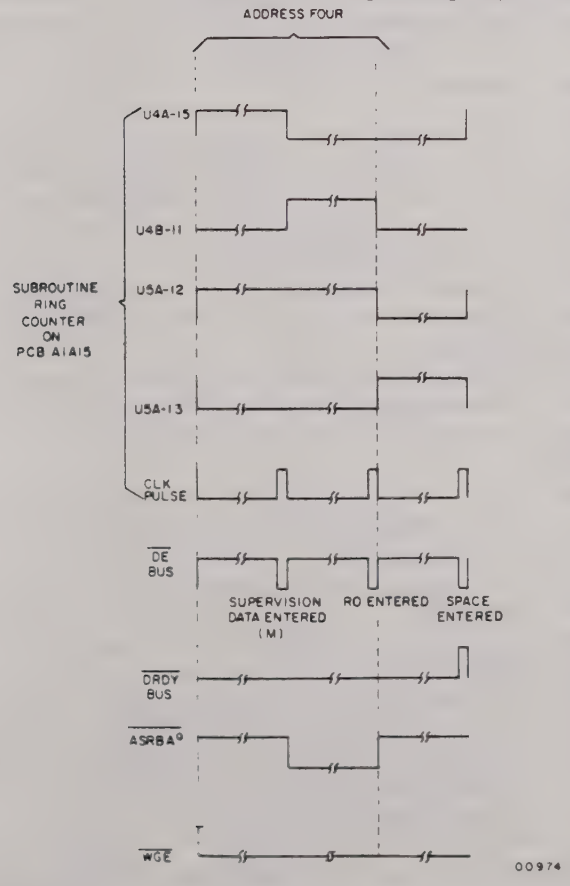


Figure 4—8. Model 2765, Address Four Synchrogram.

4.46 ADDRESS FIVE.

4.47 In this address code tone and dialed number data is processed with code tone data following the two character format. In the following discussion it will be assumed that MF Signaling received is comprised of KP 6032247466ST. To avoid repetition, only processing of KP, first number 6, last number 6, and code tone ST will be discussed. It should be noted that code tones KP and ST are processed to printable characters K1 and S, respectively. When the S is processed, a space is generated along with the S to complete the two character format.

4.48 Referring to Figure 4—9 and Figure 4—10, address five appears on the Function Address Bus (FAB) and is recognized by the Dialed Number Organizer pcb A1A9. The pcb A1A9 then provides a LO on its word gate enable ($\overline{WGE}$), data ready ($\overline{DRDY}$) and subroutine request ($\overline{SRR}$) outputs. The dialed number address (DNA) output is brought HI. The $\overline{SRR}$ bus must be active (LO) in address five in order to clock the Subroutine Ring Counter on pcb A1A15

4.49 The $\overline{WGE}$ enables programmable read only memory (PROM) U6 on pcb A1A15 to encode code tone data latched by Code Tone Organizer circuit on pcb A1A9. The $\overline{DRDY}$ is routed to Shift In Control on pcb A1A17 where it enables the first character (K) written on the ASCII Bus by PROM U6 to be shifted into

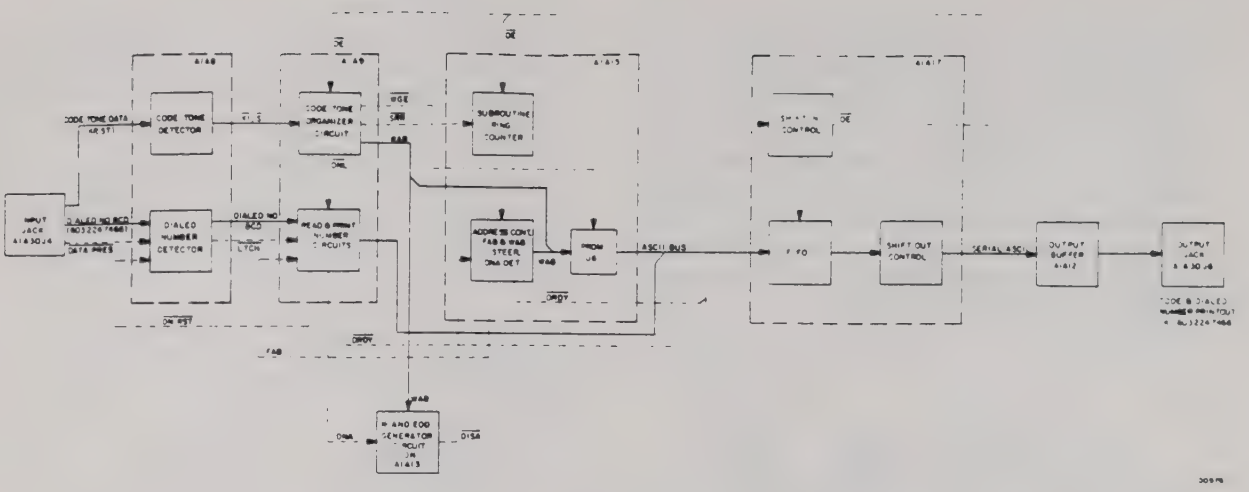


Figure 4—9. Model 2765, Block Diagram of Address Five Code and Dialed Number Data Processing.

the first-in first-out memory (FIFO). The DNA output is routed to pcb A1A13 where it enables the Asterisk and EOD Generator

4.50 As data is shifted into the FIFO, $\overline{DE}$ initiates a dial number reset pulse ($\overline{DN\ RST}$) from pcb A1A9. It provides the first of two counts for counter U9 in the code tone organizer circuit on pcb A1A9. The Shift Out Control processes data (K) providing a Serial ASCII output. This output is routed to output jack A1A30J6 via Output Buffer pcb A1A12.

4.51 On pcb A1A15, $\overline{SRR}$ input enables the $\overline{DE}$ input to clock the Subroutine Ring Counter. This shifts the bit in the ring counter to its first position (U4B set - U4A reset). The address subroutine (ASRB) brings out the second code tone character (1) on the ASCII Bus via PROM U6. The $\overline{DRDY}$ bus is brought LO by pcb A1A15 enabling data (1) on the ASCII Bus to shift into the FIFO on pcb A1A17. Table 4—4 and 4—5 at the end of this section provide U6 programming and ASCII code information. This data is then shifted out serially via U8 on pcb A1A17 and routed to output jack A1A30J6 via Output Buffer pcb A1A12.

4.52 The $\overline{DE}$ pulse generated from A1A17 causes a second $\overline{DN\ RST}$ to appear at input of counter U9 in the code tone organizer circuit on pcb A1A9, and shifts the subroutine ring counter bit to its second position (U5A set - U4B reset). At this time, counter U9 clears all latches in the code tone organizer circuit. The $\overline{WGE}$ and $\overline{SRR}$ inputs to pcb A1A15 are kept LO by the subroutine ring counter until a space has been entered into the FIFO

4.53 The $\overline{DE}$ generated by entry of the space into the FIFO activates the 3.3 millisecond timer U2A in the Asterisk and EOD Generator on pcb A1A13 and shifts the subroutine ring counter bit to its original position (U4A set - U5A reset). This casues $\overline{SRR}$ input to go HI. In address five the Address Counter U8 is prevented from stepping to the next address by the inactive HI on $\overline{EOD}$ input of pcb A1A15. The ASCII coded data of the space is shifted out serially to output jack A1A30J6 via Output Buffer pcb A1A12.

4.54 The binary coded decimal (bcd) of a dialed number (6) appears at input of pcb A1A8 along with a data present pulse ($\overline{DATA\ PRES}$). Dialed Number Detector on pcb A1A8 verifies that the $\overline{DATA\ PRES}$ pulse is longer than approximately 3.0 microseconds in duration then brings $\overline{LTCH}$ output LO. This confirms dialed number data is present. The $\overline{LTCH}$ output appears at input of A1A9 This enables the Print Dialed Number circuit to latch bcd of the first dialed number (6) and write it on the ASCII Bus while simultaneously causing $\overline{DRDY}$ bus to be driven LO

4.55 The low $\overline{DRDY}$ bus enables Shift In Control to enter the first dialed number (6) into the FIFO and generate a $\overline{DE}$ output pulse. As data is being processed through the Shift Out control and routed to output jack A1A30J6 via pcb A1A12, $\overline{DE}$ causes a low going pulse to appear on pcb A19 $\overline{DN\ RST}$ output The $\overline{DN\ RST}$ generated clears the verification circuit of the Dialed Number Detector causing the $\overline{LTCH}$ output to go HI until another $\overline{DATA\ PRES}$ pulse is received This process is repeated with every dialed number The $\overline{DRDY}$ bus remains HI until a dialed number is received to be entered into the FIFO.

4.56 When an ST code tone is detected, Code Tone

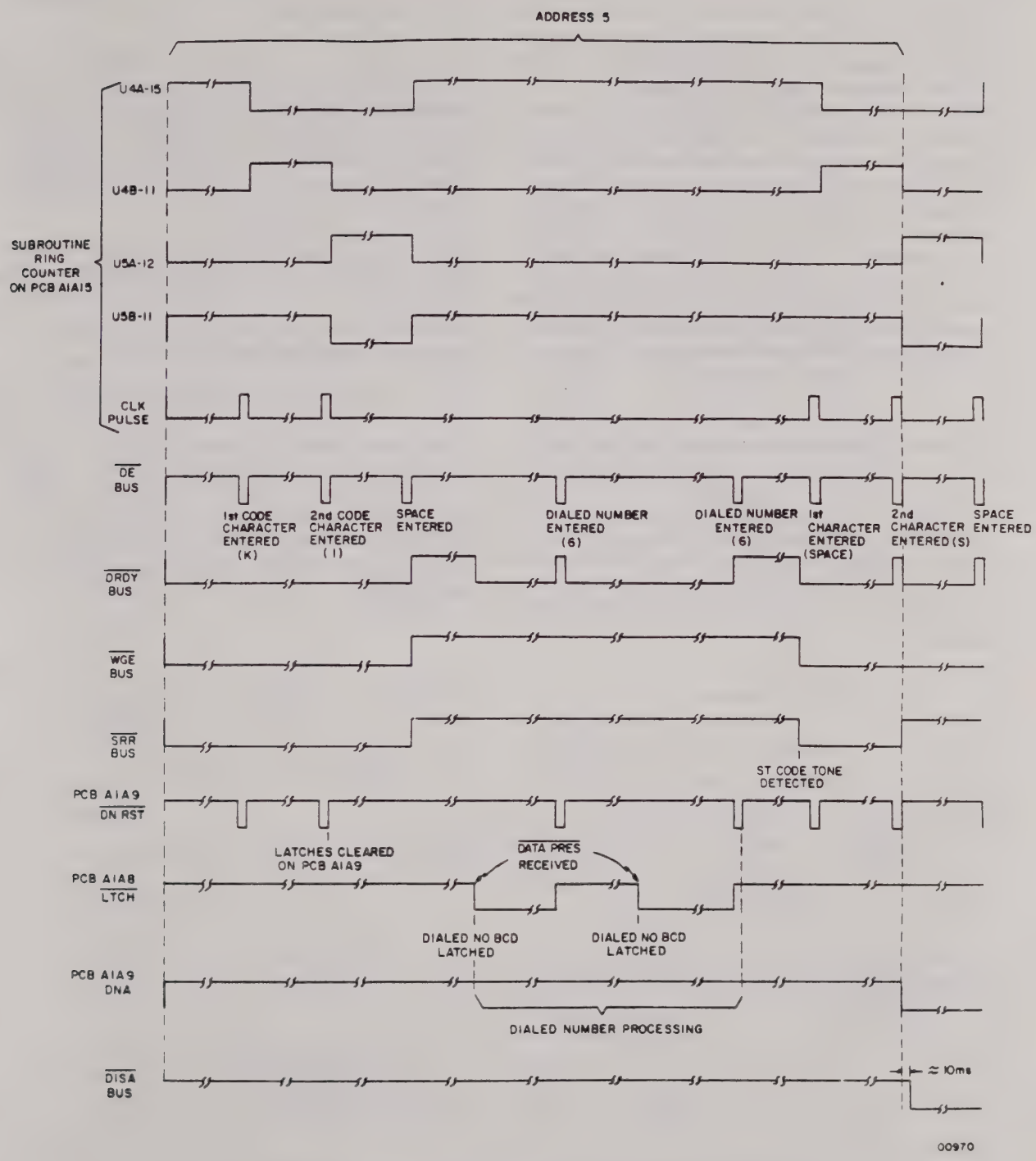


Figure 4—10. Model 2765, Address Five Synchrogram.

Detector output $\overline{S}$ goes Lo and causes the Code Tone Organizer to drive $\overline{SRR}$, $\overline{WGE}$, and $\overline{DRDY}$ outputs LO. This allows the ST code tone data to be processed in the same manner as code KP previously described at the begining of this address. A space is processed prior to the S character in order to complete the two character format.

4.57 The S address written on the Word Address Bus (WAB) by pcb A1A9 is encoded by PROM U6 on pcb A1A15 and written on the ASCII Bus. The subsequent removal of the S address on WAB after entry of the S character into the FIFO causes U2B of the Asterisk and EOD Generator on pcb A1A13 to activate. The Asterisk and EOD Generator drives $\overline{DISA}$, $\overline{WGE}$ and $\overline{DRDY}$

buses LO and writes the code for an asterisk on the WAB. Upon entry of the asterisk into the FIFO, the EOD latch U4B on pcb A1A13 is set allowing the Address Counter on pcb A1A15 to clock.

4.58 It should be noted that dialed numbers processed when Dial Pulse Signaling is monitored, are processed in the same manner as previously described for dialed numbers when MF Signaling is monitored. However, theEOD one-shot U2B on pcb A1A13 is activated differently. The $\overline{DP}$ input to pcb A1A13 follows any pulsing appearing on the E,M, or LP leads from the CDA System display unit. If the time between pulses is greater than approximately 1.4 seconds, U2B sets U4B in the Asterisk and EOD Generator causing it to write an asterisk on the WAB and initiate other functions as previously described in paragraph 4.57.

4.59 A 3-second timer on pcb A1A13 provides another means for EOD detection. It monitors time between $\overline{DE}$ pulses generated by entry of dialed number data. If a $\overline{DE}$ pulse is not generated approximately every 3 seconds, the 3-second timer will cause a question mark to be entered into the FIFO. The address on the WAB to generate a question mark will be recognized by the Asterisk and EOD Generator in the same manner as previously described for the S address and EOD will be detected.

4.60 **ADDRESS SIX.**

4.61 During this address an asterisk and two characters representing the call disposition are processed to provide printable characters. The two call disposition characters are processed following the two block character routine. The Test Results Organizer pcb A1A11 collects data from several sources within the unit to determine call dispositions.

4.62 Referring to Figure 4—11 and Figure 4—12, the disable ($\overline{DISA}$), word gate enable ($\overline{WGE}$), and data ready ($\overline{DRDY}$) outputs are kept LO by the Asterisk and EOD Generator on pcb A1A13 while it writes the asterisk code on the Word Address Bus.

4.63 The data entered pulse ($\overline{DE}$) generated when the space was entered into the first-in first-out memory (FIFO) shifts the Subroutine Ring Counter on pcb A1A15 to its original position (U4 set - U5A reset). This would normally step the Address Counter to the next address. In this case, the HI on the $\overline{EOD}$ bus along with recognition of address five by the DNA Detector on pcb A1A15 prevents the Address Counter from stepping to address six.

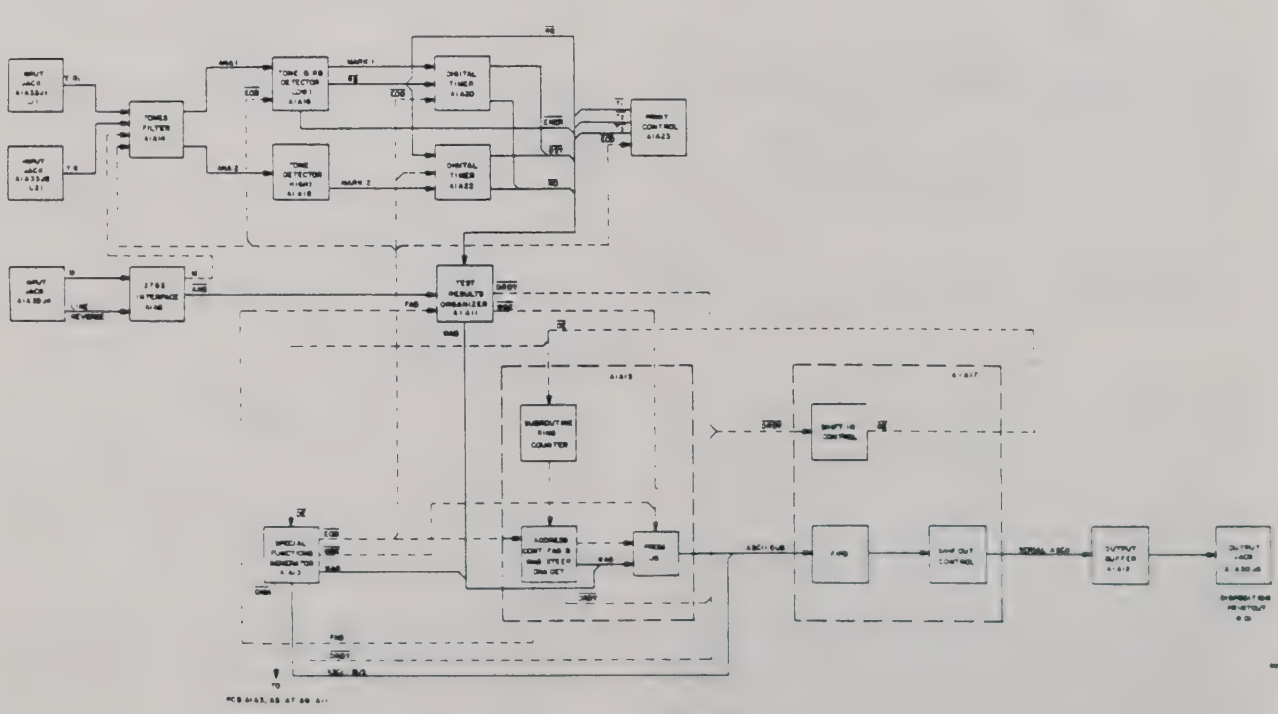


Figure 4—11. Model 2765, Block Diagram of Address Six Disposition Data Processing.

4.64 The $\overline{DISA}$ inhibits printed circuit boards from reading the Function Address Bus. Meanwhile, the asterisk written on the Word address Bus is encoded by programmable read only memory (PROM) U6 and written on the ASCII Bus. The $\overline{DRDY}$ bus is LO which enables the Shift In Control to generate a $\overline{DE}$ pulse and shift in data on the ASCII Bus. The Shift Out Control generates a serial ASCII output of the asterisk and routes it to the output jack A1A30J6 via Output Buffer pcb A1A12.

4.65 The $\overline{DE}$ generated when the asterisk entered the FIFO causes the Asterisk and EOD Generator to remove the asterisk from the Word Address Bus, drives $\overline{EOD}$ bus LO, $\overline{DISA}$ and $\overline{DRDY}$ buses HI.

4.66 The LO on $\overline{EOD}$ bus performs the following functions:

a. Allows L1 and L2 gate control circuitry on Tone Filter pcb A1A14 to detect a HI on M or E-LP inputs. In this case M input is HI. This allows supervisory tones appearing on L2 input to be processed through pcb A1A14 and routed to pcb A1A16 and A1A18.

b. Allows Subroutine Ring Counter on pcb A1A15 to advance the Address Counter to address six.

c. Enables Tone and Ringback Detector (LOW) pcb A1A16 to detect energy (ENER) and audible ringing (RB).

d. Enables digital timers on Digital Timer pcb A1A20 and A1A22 to detect a busy ($\overline{BSY}$) or reorder ($\overline{REOR}$).

e. Enables disposition timers latches on the Print Control pcb A1A23 to detect time out of disposition timers.

The HI appearing on the $\overline{DISA}$ bus allows pcb A1A11 to read address six. Upon recognition of address six, Test Results Organizer pcb A1A11 drives its $\overline{WGE}$ output LO. This enables PROM U6 on pcb A1A15 to write the dispostion on the ASCII Bus.

4.67 When the called party answers, the Model 2762 signal display unit drives the E input to pcb A1A8 HI. This along with the HI on M input causes pcb A1A7 to drive its $\overline{ANS}$ output LO. This LO is routed to pcb A1A11. If $\overline{ANS}$ is LO for more than approximately 850 milliseconds, an 01 disposition is latched on pcb A1A11. The PROM address for an 01 disposition is then written on the Word Address Bus and routed to pcb A1A15. The Test Results Organizer pcb A1A11 also monitors its $\overline{ENER}$, $\overline{RB}$, $\overline{BSY}$, $\overline{RO}$, $\overline{T1}$, $\overline{T2}$, $\overline{T3}$ and $\overline{CKT-0}$ inputs in order to determine other dispositions.

4.68 Programmable read only memory U6 on pcb A1A15 encodes 01 disposition written on WAB and writes the first character (0) on the ASCII Bus. $\overline{DRDY}$ from pcb A1A11 allows Shift In Control on pcb A1A15 to enter data into the FIFO and generate a $\overline{DE}$ pulse. The Shift Out Control shifts out the first character data serially to output jack A1A30J6 via Output Buffer pcb A1A12.

4.69 Data entered pulse $\overline{DE}$ shifts the subroutine ring counter bit to its first position (U4B set - U4A reset). This causes address subroutine bus $\overline{ASRB\ A^0}$ to go LO bringing out character (1) via U6 on pcb A1A15. This character is entered into the FIFO on pcb A1A17 and shifted out to A1A12 and A1A30J6.

4.70 The $\overline{DE}$ pulse generated when the second character is entered into the FIFO steps the subroutine

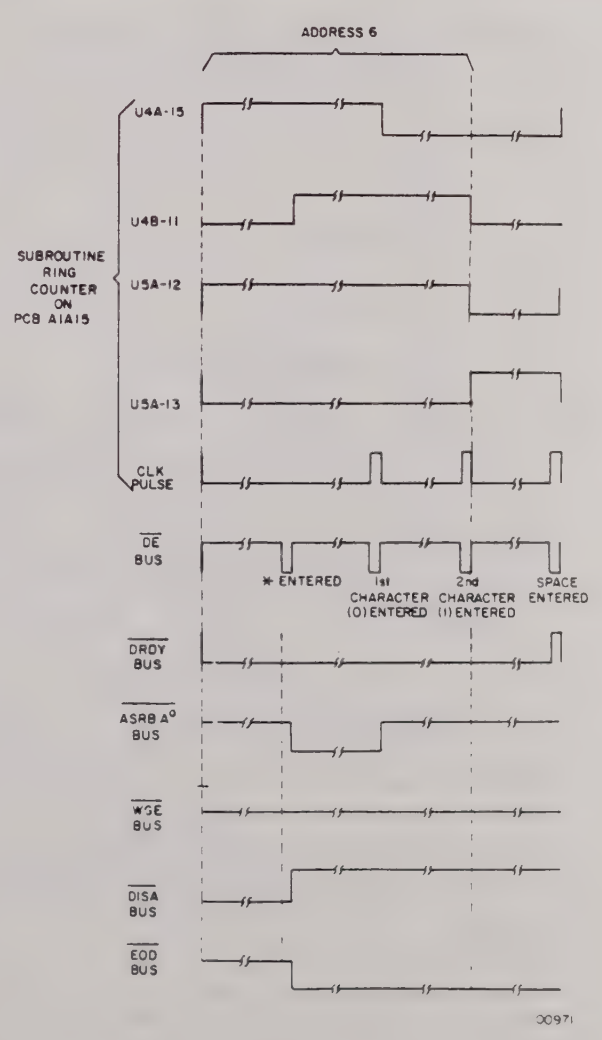


Figure 4—12. Model 2765, Address Six Synchrogram.

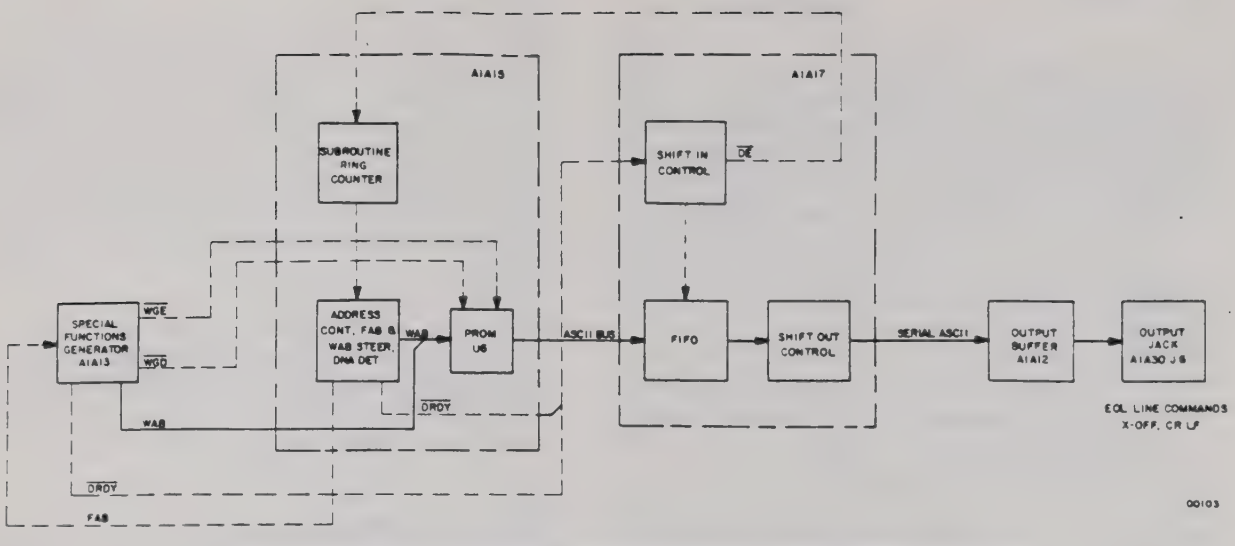


Figure 4—13. Model 2765, Block Diagram of Address Seven and Eight EOL Data Processing.

ring counter bit to its second position (U5A set - U4B reset). Address six is removed from the Function Address Bus. $\overline{WGE}$ and $\overline{DRDY}$ buses are kept LO by pcb A1A15. PROM U6 on pcb A1A15 writes a space on the ASCII Bus. The space is processed through pcb A1A17, A1A12 and routed to output jack A1A30J6.

4.71 The $\overline{DE}$ pulse generated when the space was entered into the FIFO steps the subroutine counter bit to its original position causing address seven to appear on the Function Address Bus.

4.72 **ADDRESS SEVEN AND EIGHT.**

4.73 Addresses seven and eight provide the X-OFF, CR, and LF data associated with the end of line routine. Referring to Figures 4—13 and 4—14, when address seven appears on the Function Address Bus (FAB), Special Functions Generator pcb A1A13 recognizes this address and in turn drives the data ready ($\overline{DRDY}$) bus and word gate enable ($\overline{WGE}$) bus LO. It then writes the address for X-OFF control command on the Word Address Bus (WAB). The $\overline{DRDY}$ is routed to the Shift In Control on pcb A1A17 which in turn allows first-in first-out memory (FIFO) to accept data. The $\overline{WGE}$ is routed to pcb A1A15 where it allows programmable read only memory (PROM) U6 to read the address appearing on WAB. As X-OFF data is shifted into the FIFO, the Shift In Control generates a low going pulse on $\overline{DE}$ bus. The $\overline{DE}$ is routed to the Address Control pcb A1A15. The X-OFF data is then shifted out of the FIFO, processed by the Shift Out Control to provide a serial ASCII output, and routed to output jack A1A30J6 via Output Buffer pcb A1A12. Table 4—4 and 4—5, at the end of this section provide U6 programming and ASCII code information.

4.74 The $\overline{DE}$ output from pcb A1A17 shifts the bit in the Subroutine Ring Counter on pcb A1A15 (U4B set - U4A reset). This causes the address subroutine bus $\overline{ASRB\ A}^{0}$ to go LO, enabling PROM U6 to write CR control data on the ASCII Bus. Special Functions Generator pcb A1A13 keeps $\overline{DRDY}$ bus LO which enables Shift In Control to enter CR control data into the FIFO on pcb A1A17. As data is entered into the FIFO, the Shift In Control generates a $\overline{DE}$ output pulse. The Shift Out Control processes CR control data to produce a serial ASCII output that is routed to output jack A1A30J6 via Output Buffer pcb A1A12.

4.75 The $\overline{DE}$ output shifts the ring counter bit on pcb A1A15 to its final position (U5A set - U4B reset). This causes the following on pcb A1A15:

a. The removal of address seven from the FAB

b. $\overline{DRDY}$ and $\overline{WGE}$ buses are driven LO by pcb A1A15.

4.76 When address seven is removed from FAB, pcb A1A13 drives the word gate disable ($\overline{WGD}$) bus LO. This inhibits PROM U6 on pcb A1A15 which would have been enabled by the LO on the $\overline{WGE}$ bus. Since $\overline{DRDY}$ bus is LO and there is a no data condition on the ASCII Bus, a delete or rub out (RO) is entered into the FIFO. The $\overline{DE}$ pulse generated from entry of RO data into the FIFO shifts the subroutine ring counter bit to its original position (U4A set - U5A reset). The $\overline{DE}$ pulse also drives output $\overline{WGD}$ HI on pcb A1A13. The Subroutine Ring Counter clocks the Address Counter, causing address eight to appear on FAB.

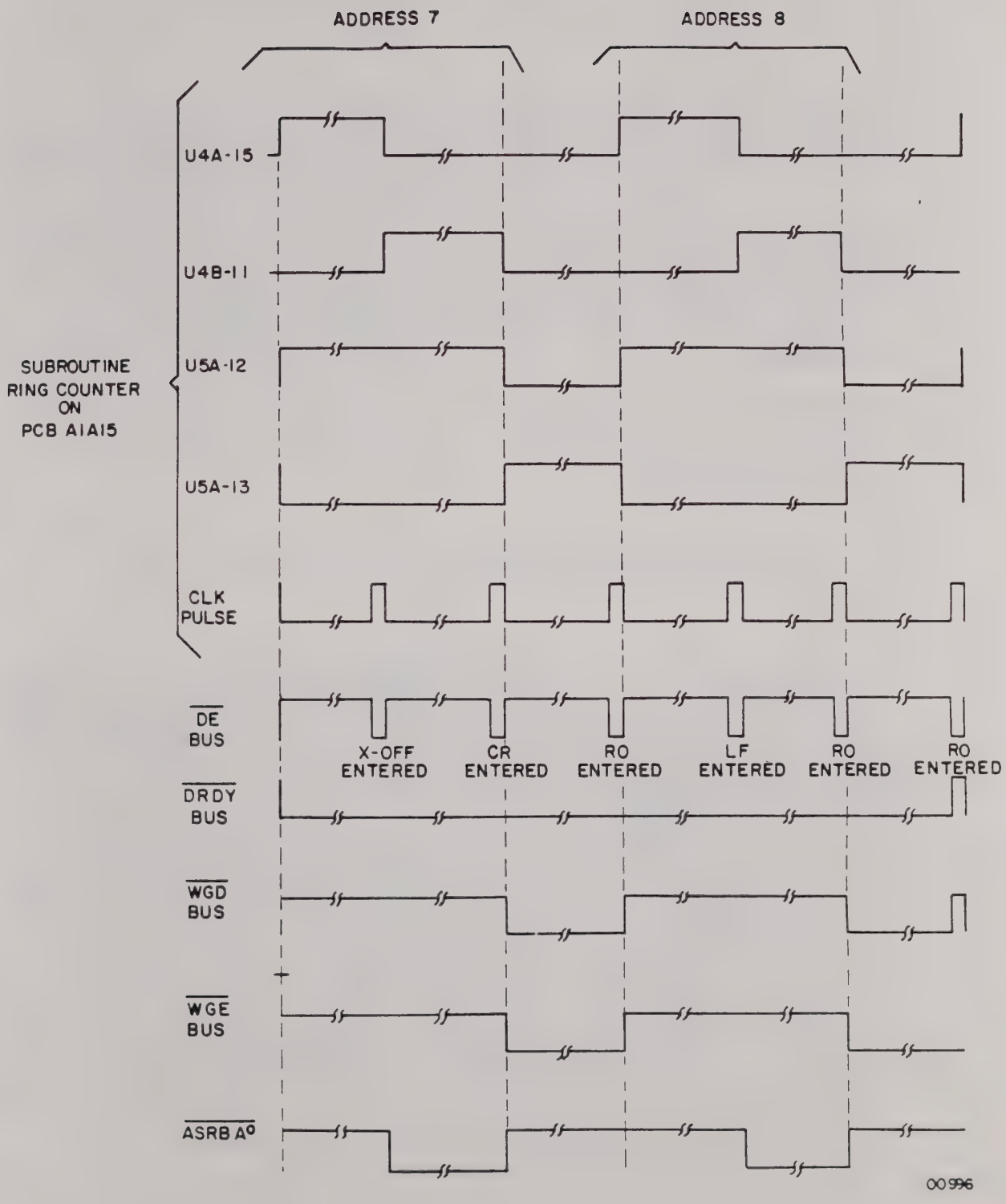


Figure 4—14. Model 2765, Address Seven and Eight Synchrogram.

4.77 Special Functions Generator pcb A1A13 recognizes address eight then writes the address for LF data on the WAB. This data is processed in the same two block character routine previously described for processing the X-OFF and CR control data. However, in this address PROM U6 writes an RO on the ASCII Bus upon recognition of the address subroutine command to complete the two character block format as shown in Figure 4 – 14.

4.78 Upon exit of address eight another RO is entered into the FIFO as described in paragraph 4.76 above. This time when the Subroutine Ring Counter clocks the Address Counter U8 on pcb A1A15, address nine is written on the FAB.

4.79 **ADDRESS NINE.**

4.80 This address enables the Model 2765 to generate a reset command which conditions its circuits and peripheral CDA System equipment to access a different trunk and process another line of data.

4.81 Referring to Figure 4 – 15, when address nine appears on the Function Address Bus (FAB), it is recognized by the Special Functions Generator pcb A1A13. This recognition drives auto reset ($\overline{\text{AUTO RST}}$) and system reset ($\overline{\text{SMR}}$) outputs LO and system reset (SMR) output HI. The SMR output provides a remote reset command for the CDA System access unit via Output Buffer pcb A1A12 and jack A1A30J1. The $\overline{\text{SMR}}$ output resets the circuit access detector circuit on pcb A1A5. This causes CAD output to go LO and $\overline{\text{CAD}}$ output to go HI. A high $\overline{\text{CAD}}$ bus is recognized by pcb A1A8 which causes it to drive its $\overline{\text{REMOTE RESET}}$ output LO. The remote reset command is routed to, in this case, a Model 2762 display unit via jack A1A30J4. The CAD and $\overline{\text{CAD}}$ outputs are also routed to several printed circuit boards as shown in the block diagram Figure 4 – 15. They provide resetting functions on these various printed circuit boards making it possible to process new data relating to the next trunk access by the trunk access unit. The $\overline{\text{AUTO RST}}$ output is routed to Address Control pcb A1A15 to clear the Address Counter U8.

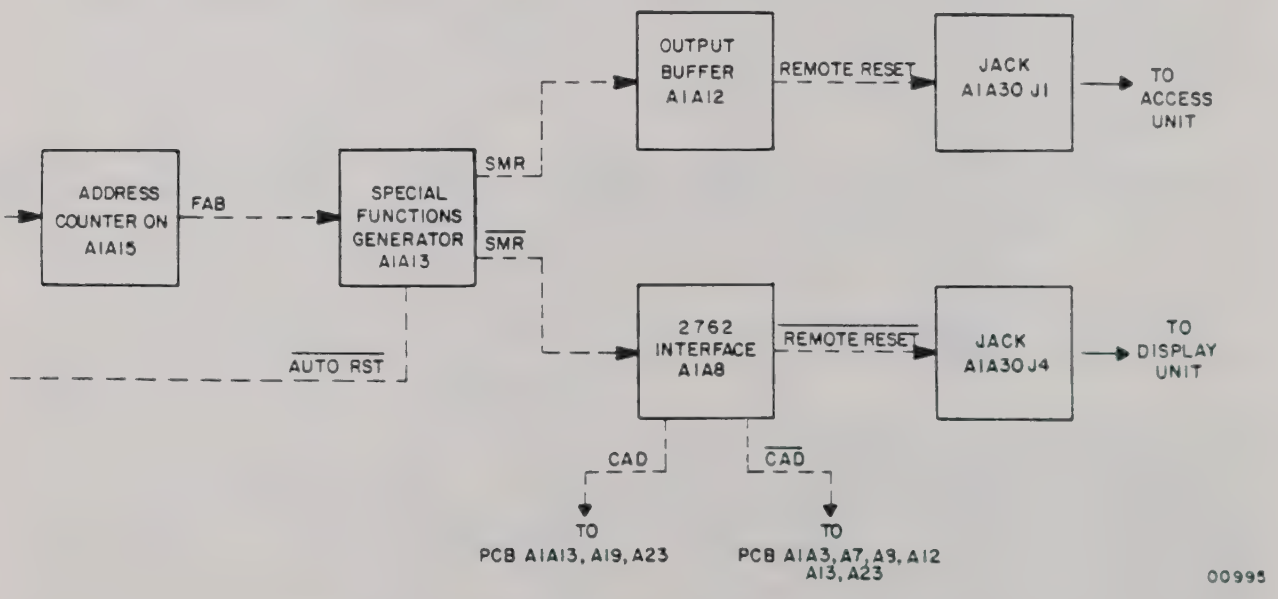


Figure 4—15. Model 2765, Block Diagram of Address Nine System Reset Control Signal Processing.

Table 4—1. Bus State During Data Processing of Time of Day.

PCB PIN No	BUSES										DATA SOURCE PCB No.	DATA PROCESSED	
	FAB $2^0 2^1 2^2 2^3$	WAB $A^1 A^2 A^3 A^4 A^5$	$\overline{ASRBA^0}$	$\overline{WGE}$	$\overline{WGD}$	LOAD	$\overline{DISA}$	$\overline{PRNT}$	$\overline{CLK\ ENA}$	$\overline{ASCII}$			
ADDRESS	A B C D	F H J K L	E	P	R	16	S	15	R	1 2 3 4 5 6 7			
1	0 1 1 1	1 1 1 1 1	1	1	1	1	1	0	0	1 0 0 0 1 1 0	A1A3	1	TIME OF DAY
1	0 1 1 1	1 1 1 1 1	0	1	1	1	1	0	0	1 0 0 0 1 1 0		1	
0	1 1 1 1	1 1 1 1 1	1	0	0	1	1	0	0	1 1 1 1 1 1 1		RO	
2	1 0 1 1	1 1 1 1 1	1	1	1	1	1	0	0	1 0 1 0 1 1 0	A1A3	5	
2	1 0 1 1	1 1 1 1 1	0	1	1	1	1	0	0	0 0 1 0 1 1 0		4	
0	1 1 1 1	1 1 1 1 1	1	0	1	0	1	0	0	0 0 0 0 0 1 0		SPACE	EOL ROUTINE
7	0 0 0 1	1 0 0 0 0	1	0	1	1	1	0	0	1 1 0 0 1 0 0	A1A13	X-OFF	
7	0 0 0 1	1 0 0 0 0	0	0	1	1	1	0	0	1 0 1 1 0 0 0		CR	
0	1 1 1 1	1 1 1 1 1	1	0	0	1	1	0	0	1 1 1 1 1 1 1		RO	
8	1 1 1 0	0 0 0 0 0	1	0	1	1	1	0	0	0 1 0 1 0 0 0	A1A13	LF	
8	1 1 1 0	0 0 0 0 0	0	0	1	1	1	0	0	1 1 1 1 1 1 1		RO	
0	1 1 1 1	1 1 1 1 1	1	0	0	1	1	0	0	1 1 1 1 1 1 1		RO	

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Table 4—2. Bus State During Data Processing of Time Set on Disposition Timers.

PCB PIN No.	BUSES										DATA SOURCE PCB No.	DATA PROCESSED	
	FAB	WAB	$\overline{ASRBA^0}$	$\overline{WGE}$	$\overline{WGD}$	LOAD	$\overline{DISA}$	$\overline{PRNT}$	$\overline{TENA}$	$\overline{ASCII}$			
ADDRESS	A B C D	F H J K L	E	P	R	16	S	15	P	1 2 3 4 5 6 7			
1	1 1 1 1	1 0 1 1 1	1	0	1	1	0	0	0	0 0 1 0 1 0 1	A1A15	T	TIME SET ON DISPOSITION TIMERS
1	1 1 1 1	1 0 1 1 1	0	0	1	1	0	0	0	1 0 0 0 1 1 0		1	
0	1 1 1 1	1 1 1 1 1	0	0	1	1	0	0	0	1 0 1 1 1 1 0		•	
2	1 0 1 1	1 1 1 1 1	1	1	1	1	0	0	0	1 0 0 0 1 1 0	A1A25	1	
2	1 0 1 1	1 1 1 1 1	0	1	1	1	0	0	0	0 0 0 0 1 1 0		0	
0	1 1 1 1	1 1 1 1 1	1	0	1	1	0	0	0	0 0 0 0 0 1 0		SPACE	
3	1 1 1 1	1 0 0 1 1	1	0	1	1	0	0	0	0 0 1 0 1 0 1	A1A15	T	
3	1 1 1 1	1 0 0 1 1	0	0	1	1	0	0	0	0 1 0 0 1 1 0		2	
0	1 1 1 1	1 1 1 1 1	0	0	1	1	0	0	0	1 0 1 1 1 1 0		=	
4	1 1 0 1	1 1 1 1 1	1	1	1	1	0	0	0	1 0 0 0 1 1 0	A1A25	1	
4	1 1 0 1	1 1 1 1 1	0	1	1	1	0	0	0	1 0 1 0 1 1 0		5	
0	1 1 1 1	1 1 1 1 1	1	0	1	1	0	0	0	0 0 0 0 0 1 0		SPACE	
5	1 1 1 1	1 0 1 0 1	1	0	1	1	0	0	0	0 0 1 0 1 0 1	A1A15	T	
5	1 1 1 1	1 0 1 0 1	0	0	1	1	0	0	0	1 1 0 0 1 1 0		3	
0	1 1 1 1	1 1 1 1 1	0	0	1	1	0	0	0	1 0 1 1 1 1 0		•	
6	1 0 0 1	1 1 1 1 1	1	1	1	1	0	0	0	0 1 0 0 1 1 0	A1A25	2	
6	1 0 0 1	1 1 1 1 1	0	1	1	1	0	0	0	0 0 0 0 1 1 0		0	
0	1 1 1 1	1 1 1 1 1	1	0	1	1	0	0	0	0 0 0 0 0 1 0		SPACE	
7	0 0 0 1	1 0 0 0 0	1	0	1	1	0	0	0	1 1 0 0 1 0 0	A1A15	X-OFF	EOL ROUTINE
7	0 0 0 1	1 0 0 0 0	0	0	1	1	0	0	0	1 0 1 1 0 0 0		CR	
0	1 1 1 1	1 1 1 1 1	1	1	1	1	0	0	0	1 1 1 1 1 1 1		RO	
8	1 1 1 0	0 0 0 0 0	1	0	1	1	0	0	0	0 1 0 1 0 0 0	A1A15	LF	
8	1 1 1 0	0 0 0 0 0	0	0	1	1	0	0	0	1 1 1 1 1 1 1		RO	
0	1 1 1 1	1 1 1 1 1	1	0	0	1	0	0	0	1 1 1 1 1 1 1		RO	

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Table 4—3. Bus State During Data Processing of an 01 Disposition.

PCB PIN No.	BUSES																				DATA SOURCE PCB NO.	DATA PROCESSED	
	FAB 2^0 2^1 2^2 2^3				WAB A^1 A^2 A^3 A^4 A^5					ASRB A^0	WGE	WGD	EOD	DISA	ASCII								
ADDRESS	A	B	C	D	F	H	J	K	L	E	P	R	IQ	S	1	2	3	4	5	6	7		
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	A1A3	1
1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	1	0		3
0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1		RO
2	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0	A1A3	5
2	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0	1	1	0		0
0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1		SPACE
3	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	A1A5	1
3	0	0	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	0	1	1	0		4
0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	1	0		SPACE
4	1	1	0	1	1	0	0	0	1	1	0	1	1	1	1	0	1	1	0	0	1	A1A7	M
4	1	1	0	1	1	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1		RO
0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	1	0		SPACE
5	0	1	0	1	0	0	1	1	1	1	0	1	1	1	1	1	0	1	0	0	1	A1A9	K
5	0	1	0	1	0	0	1	1	1	0	0	1	1	1	1	0	0	0	1	1	0		1
0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	1	0		SPACE
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0		6
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	0		0
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0		3
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0		2
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0		2
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	0		4
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0		7
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	0		4
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0		6
5	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0		6
5	0	1	0	1	0	0	0	1	1	1	0	1	1	1	0	0	0	0	0	1	0		SPACE
5	0	1	0	1	0	0	0	1	1	0	0	1	1	1	1	1	0	0	1	0	1		S
0	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	1	0		SPACE
6	1	0	0	1	0	1	1	1	1	1	0	1	0	0	0	1	0	1	0	1	0		*
6	1	0	0	1	1	1	0	0	0	1	0	1	0	1	0	0	0	0	1	1	0	A1A11	0
6	1	0	0	1	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	1	0		1
0	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	1	0		SPACE
7	0	0	0	1	1	0	0	0	0	1	0	1	0	1	1	1	0	0	1	0	0	A1A13	X-OFF
7	0	0	0	1	1	0	0	0	0	0	0	1	0	1	1	0	1	1	0	0	0		CR
0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1		RO
8	1	1	1	0	0	0	0	0	0	1	0	1	0	1	0	1	0	1	0	0	0	A1A13	LF
8	1	1	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1		RO
0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1		RO

TIME OF DAY

CIRCUIT NO

ORIGINATING SUPERVISION

DIALED NUMBER

DISPOSITION

EOL ROUTINE

00990

Table 4—4. Programming of PROM U6 (A) on pcb A1A15 Used in Basic Model 2765.

FUNCTION		DEC LOG	PCB A1A15 PIN NO	ASR B	WA8						ASCII BUS							
					A0	A1	A2	A3	A4	A5	1	2	3	4	5	6	7	8
					E	F	H	J	K	L	U6 OUTPUT							
					U6 ADDRESS													
DESCRIPTION	SCRIPT		COL→		0	1	2	3	4	5	0	1	2	3	4	5	6	7
TTY CONTROL	RO	0 0			0	0	0	0	0	0	1	1	1	1	1	1	1	0
	LF	0 1			1	0	0	0	0	0	0	1	0	1	0	0	0	0
EOL	CR	0 2			0	1	0	0	0	0	1	0	1	1	0	0	0	0
	X-OFF	0 3			1	1	0	0	0	0	1	1	0	0	1	0	0	0
CALL ABANDONED	8	0 4			0	0	1	1	0	0	0	0	0	1	1	0	0	0
	0	0 5			1	0	1	0	0	0	0	0	0	0	1	1	0	0
COMPLETED CALL	1	0 6			0	1	1	0	0	0	1	0	0	0	1	1	0	0
	0	0 7			1	1	1	0	0	0	0	0	0	0	1	1	0	0
COMPUTER ANSWER	9	0 8			0	0	0	1	0	0	1	0	0	1	1	0	0	0
	0	0 9			1	0	0	1	0	0	0	0	0	0	1	1	0	0
BUSY	2	1 0			0	1	0	1	0	0	1	0	0	0	1	1	0	0
	0	1 1			1	1	0	1	0	0	0	0	0	0	1	1	0	0
NO DECISION	0	1 2			0	0	1	1	0	0	1	0	0	0	1	1	0	0
	0	1 3			1	0	1	1	0	0	0	0	0	0	1	1	0	0
REORDER	3	1 4			0	1	1	1	0	0	1	1	0	0	1	1	0	0
	0	1 5			1	1	1	1	0	0	0	0	0	0	1	1	0	0
BLUE BOX	0	1 6			0	0	0	0	1	1	0	0	0	0	1	1	0	0
	1	1 7			1	0	0	0	1	1	1	0	0	0	1	1	0	0
DOSEN'T ANSWER	4	1 8			0	1	0	0	1	1	0	0	1	0	1	1	0	0
	0	1 9			1	1	0	0	1	1	1	0	0	0	1	1	0	0
(OPTIONAL)	1	2 0			0	0	1	0	1	1	0	0	0	0	1	1	0	0
	1	2 1			1	0	1	0	1	1	1	0	0	0	1	1	0	0
NO ANSWER SUPERVISION	5	2 2			0	1	1	0	1	1	0	0	0	0	1	1	0	0
	0	2 3			1	1	1	0	1	1	1	0	0	0	1	1	0	0
(OPTIONAL)	2	2 4			0	0	0	1	1	1	0	0	0	0	1	1	0	0
	1	2 5			1	0	0	1	1	1	1	0	0	0	1	1	0	0
NO RING NO ANSWER	6	2 6			0	1	0	1	1	1	0	1	1	0	1	1	0	0
	0	2 7			1	1	0	1	1	1	0	0	0	0	1	1	0	0
(OPTIONAL)	3	2 8			0	0	1	1	1	1	1	1	0	0	1	1	0	0
	1	2 9			1	0	1	1	1	1	1	0	0	0	1	1	0	0
SENDER RETRIAL	7	3 0			0	1	1	1	1	1	0	1	1	1	1	1	0	0
	0	3 1			1	1	1	1	1	1	0	0	0	0	1	1	0	0
IN (01) INHIBIT	N	3 2			0	0	0	0	0	1	0	1	1	1	1	0	0	0
	I	3 3			1	0	0	0	0	1	1	0	0	0	1	0	0	0
E-LD	RO	3 4			0	1	0	0	0	1	0	0	1	1	1	1	1	0
	E	3 5			1	1	0	0	0	1	1	0	1	0	0	0	1	0
M-LD	RO	3 6			0	0	1	0	0	1	0	0	1	1	1	1	1	0
	M	3 7			1	0	1	0	0	1	1	0	1	1	0	0	1	0
LOOP	RO	3 8			0	1	1	0	0	1	0	0	1	1	1	1	1	0
	L	3 9			1	1	1	0	0	1	1	0	1	1	0	0	1	0
? (ORIGINATING SUPV)	RO	4 0			0	0	0	1	0	1	0	0	1	1	1	1	1	0
	?	4 1			1	0	0	1	0	1	1	0	1	1	1	1	1	0
T3	3	4 2			0	1	0	1	0	1	0	0	1	1	1	1	0	0
	T	4 3			1	1	0	1	0	1	1	0	1	0	1	0	1	0
C12	2	4 4			0	0	1	1	0	1	0	0	1	1	0	0	1	0
	C	4 5			1	0	1	1	0	1	1	0	1	0	0	0	1	0
KP2	2	4 6			0	1	1	1	0	1	0	0	1	1	0	0	1	0
	K	4 7			1	1	1	1	0	1	1	0	1	0	1	0	1	0
ST	S	4 8			0	0	0	0	1	1	1	1	0	0	1	0	1	0
	SPACE	4 9			1	0	0	0	1	1	0	0	0	0	0	1	0	0
T2	2	5 0			0	1	0	0	1	1	0	0	1	0	0	1	1	0
	T	5 1			1	1	0	0	1	1	0	0	1	0	1	0	1	0
C11	1	5 2			0	0	1	0	1	1	1	0	0	0	1	1	0	0
	C	5 3			1	0	1	0	1	1	0	0	1	0	0	1	1	0
? (NO ST)	?	5 4			0	1	1	0	1	1	1	1	1	1	1	1	0	0
	SPACE	5 5			1	1	1	0	1	1	0	0	0	0	0	1	0	0
KP	1	5 6			0	0	0	1	1	1	1	0	0	0	1	1	0	0
	K	5 7			1	0	0	1	1	1	0	1	1	0	1	0	1	0
TI	1	5 8			0	1	0	1	1	1	1	0	0	0	1	1	0	0
	T	5 9			1	1	0	1	1	1	0	0	1	0	1	0	1	0
PRINTER CONTROL FLOATING CHARACTER	H	6 0			0	0	1	1	1	1	0	0	1	0	0	1	1	0
	*	6 1			1	0	1	1	1	1	0	1	0	1	0	0	1	0
	.	6 2			0	1	1	1	1	1	1	0	1	1	1	1	0	0
	SPACE	6 3			1	1	1	1	1	1	0	0	0	0	0	1	0	0

01009

Table 4—5. ASCII Code.

b7 → / b6 → / b5 → / BITS b4 b3 b2 b1 ↓ / COLUMN → / ROW ↓	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
	0	1	2	3	4	5	6	7
0 0 0 0	0	NUL	DLE	SPACE	ø	O	P	`	p
0 0 0 1	1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	2	STX	DC2	"	2	B	R	b	r
0 0 1 1	3	ETX	DC3	#	3	C	S	c	s
0 1 0 0	4	EOT	DC4	$	4	D	T	d	t
0 1 0 1	5	ENG	NAK	%	5	E	U	e	u
0 1 1 0	6	ACK	SYN	&	6	F	V	f	v
0 1 1 1	7	BEL	ETR	'	7	G	W	g	w
1 0 0 0	8	BS	CAN	(	8	H	X	h	x
1 0 0 1	9	HT	EM	)	9	I	Y	i	y
1 0 1 0	10	LF	SUB	*	:	J	Z	j	z
1 0 1 1	11	VT	ESC	+	;	K	[	k	(
1 1 0 0	12	FF	FS	,	<	L	\	l	:
1 1 0 1	13	CR	GS	-	=	M	]	m	)
1 1 1 0	14	SO	RS	.	>	N	↑	n	~
1 1 1 1	15	SI	US	/	?	O	←	o	RO

SECTION 5

MAINTENANCE AND CALIBRATION

5.1 INTRODUCTION.

5.2 This section provides a description of the Northeast Electronics Model 2765 Program Analyzer accessory and information and instructions for preventive and corrective maintenance of the Model 2765 unit. In the troubleshooting discussion the Model 2765 Program Analyzer is used as a valuable aid to help isolate various problems. Section Three and Four of this manual provides the Model 2765 theory of operation and circuit theory, respectively, that serve as indispensible supplements to facilitate troubleshooting.

5.3 SERVICE INFORMATION.

5.4 Each instrument manufactured by Northeast Electronics is warranted for a period of one year upon delivery to the original purchaser. Complete warranty information is located on the rear of the title page of this manual. Note that written authorization is required prior to the return of any equipment for factory repairs. Additional service information can be obtained by contacting Northeast Electronics, Customer Service Department, P.O. Box 649, Concord, New Hampshire, 03301, telephone 603-224-6521.

5.5 MODEL 2765 PROGRAM ANALYZER ACCESSORY.

5.6 The Model 2765 Program Analyzer is a test and troubleshooting accessory to help the technician in diagnosing problems in the Model 2765 Call Disposition Analyzer (Model 2765). The Model 2765 has an open collector bus system. The logic state of the bus lines at any given time during the process of a call will, at that time, determine what information is provided on the data output of the Model 2765. The Model 2765 Program Analyzer is designed to bridge across the Model 2765 bus lines to provide the following testing and troubleshooting functions:

a. A visual monitor of the logic state on all relevant bus lines.

b. Manual control of the Model 2765 as it steps through its data processing routine.

c. A means to generate a power up routine (carriage return, line feed, and system reset) without removing power from the Model 2765.

5.7 Installation. To install the Model 2765 Program Analyzer, proceed as follows:

a. Obtain access to Model 2765 printed circuit boards as described in paragraph 5.13.

b. Insert Model 2765 Program Analyzer into extender card provided with the Model 2765.

c. With Model 2765 POWER switch in OFF position, and Program Analyzer indicators facing rear of pcb A1 A3 insert extender card and Program analyzer into slot number one of Model 2765 card cage.

5.8 Operation. The Model 2765 Program Analyzer has controls and indicators consisting of 40 light emitting diodes (indicators) three pushbutton switches, and two toggle switches. Model 2765 Program Analyzer, Controls and Indicators Table 5 – 1 provides a functional description of these controls and indicators shown in Figure 5 – 1.

5.9 TEST EQUIPMENT.

5.10 Equipment recommended for testing, troubleshooting, and calibration of the Model 2765 along with the minimum specifications required for each, is listed in Table 5 – 2. If recommended test equipment is not available, other equipment that meet the minimum specifications can be used.

NOTE

Always use the lowest possible range on the VOM and AC voltmeter for maximum accuracy.

5.11 MAINTENANCE.

5.12 ACCESS/DISASSEMBLY.

5.13 To obtain access to all the printed circuit boards in the Model 2765, proceed as follows:

a. Remove the four retaining screws located in the four corners in the rear of the Model 2765 case.

b. Pull unit straight out of its case to stops. Stops keep unit from falling out of case

c. Remove four retaining screws of the two card retainer brackets located above the printed circuit boards, then lift out brackets

Table 5—1. Model 2765 Program Analyzer Controls and Indicators.

NOTE
All indicators on the Program Analyzer are normally lit. a bus is active when its associated indiator is extinguished.

REF DES	CONTROL OR INDICATOR	FUNCTION
DS1-DS4	FAB (ABCD) indicators	Provides a visual indication of binary address on Funtion Address Bus (variable information addressing bus).
DS5	E indicator	Indicates which of two characters, in the system two character block routine, is being addressed for any given FAB or WAB address.
DS6,DS8-DS11	WAB (FHJKL) indicator	Provides an indication of address appearing on Word Address Bus (fixed information addressing bus to Model 2765 read only memory U6 on pcb A1A15)
DS12	WGE indicator	Indicates when Word Gate (PROM) is enabled to provide information on the ASCII bus.
DS13	WGD indicator	Indicates when Word Gate is disabled from providing information on the ASCII bus.
DS14	DE indicator	Indicates when data has been entered into Model 2765 memory.
DS15-21	ASCII (1-7) indicators	Indicates ASCII code that will be entered into the Model 2765 memory when a data ready $\overline{\text{DRDY}}$ command is given.
DS22	DRDY indicator	Indicates when data is ready on ASCII bus to be entered into Model 2765 memory.
DS23,DS25	Test A & TEST B indicators	Provides a means to determine (test) the state of logic signals in the Model 2765. When a signal to be tested is applied to test point "A" on rear of program analyzer card, a LO or Logic "0" level will light TEST A indicator. A HI or logic "1" level will extinguish TEST A indicator TEST B lamp can also be used when a signal is applied to test point "B"
DS24	DISA indicator	Indicates when Model 2765 is being disabled from processing a normal call printout routine
DS26	CAD indicator	Indicates when Model 2765 has detected a circuit access or has been accessed internally to print front panel control settings
DS27	EOD indicator	Indicates when Model 2765 has detected end of dialing (disposition detection begins at this point)
DS28	SMR indicator	Indicates when Model 2765 is held reset in the IDLE mode

Table 5—1 (cont'd)

REF DES	CONTROL OR INDICATOR	FUNCTION
DS29	EXT indicator	Indicates a Model 2765 reset command from an external source such as a reset from OPTION "A".
DS30	AUTO indicator	Indicates when Model 2765 has completed process of a line of data and is given an automatic reset.
DS31	PWR indicator	Indicates a reset given upon power up of the Model 2765.
DS32	OH indicator	Indicates when the Model 2765 has detected an off-hook (answer supervision) from the called office.
DS33-DS35	T1, T2, T3 indicators	Indicates when the time set on each disposition timer has elasped.
DS36	TEST 1 indicator	Indicates when a tone is being recognized by the low-level (A1A16) tone detector of the Model 2765.
DS37	RB indicator	Indicates when the Model 2765 has detected ring-back (audible ringing).
DS38	ENER indicator	Indicates when the Model 2765 has detected tone-band energy.
DS39	TEST II indicator	Indicates when a tone has been detected by the high-level (A1A18) tone detector of the Model 2765.
DS40	PRINT indicator	Indicates when the Model 2765 is printing information other than that from a normal call routine. (e.g., from setting of front panel controls on the Model 2765.)
S1	STEP ENA (enable) toggle switch	Controls manual or automatic operation. When positioned to the right, the Model 2765 operates at normal speed. When positioned to the left, the Model 2765 operates under control of the STEP pushbutton.
S2	PWR RESET push-button switch	Provides the means to initiate a system power up reset When depressed, it causes the Model 2765 to abandon a normal routine and proceed to the end of line routine consisting of carraige return data, line feed data, and overall system reset.
S3	STEP pushbutton switch	Provides the means to step the Model 2765 through its normal printout routine manually. When depressed with the STEP ENA switch position to the left, a character is is entered into the Model 2765 memory to be provided on the data output.

Table 5—1 (cont'd)

REF DES	CONTROL OR INDICATOR	FUNCTION
S4	MARK pushbutton switch	Provides the means to simulate a received tone on the output of the Model 2765 disposition tone detectors. Depressing and releasing the button at a rate necessary for audible ring, energy, busy or reorder detection will cause the Model 2765 to detect these tone conditions.
S5	TEST toggle switch	Selects which tone detector the MARK pushbutton is simulating. TEST I is selected when an audible ring, energy, busy, or reorder is to be simulated out of the low-level tones detector on pcb A1A16. TEST II is selected when a busy or reorder is to be simulated out of the high-level tones detector on pcb A1A18).

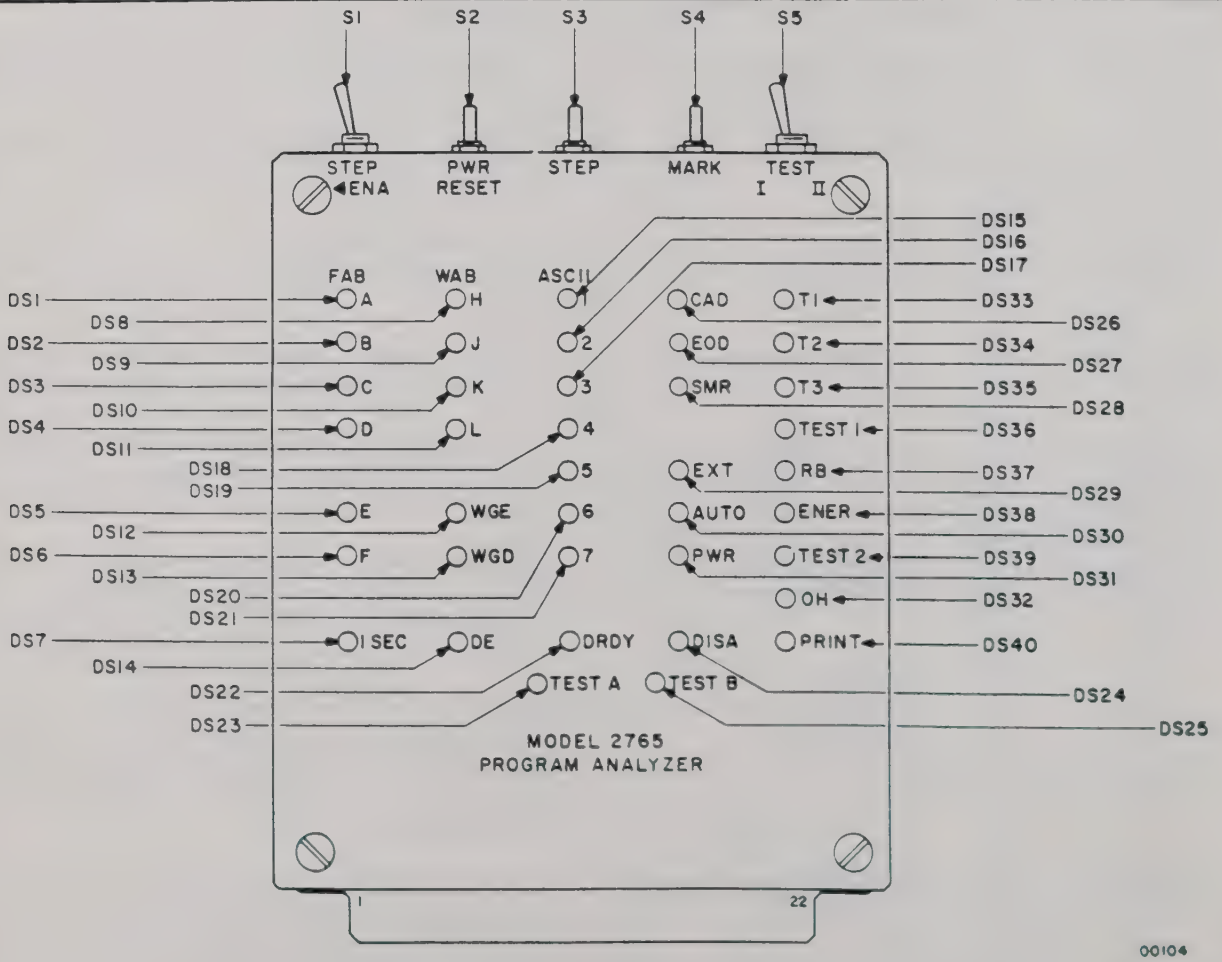


Figure 5—1. Model 2765 Program Analyzer Controls and Indicators.

Table 5—2. Test and Calibration Equipment.

Equipment Nomenclature	Required Specifications	Recommended Equipment
AC Voltmeter	Min. Range: −43 dB to +10 dB Input Impedance: 10 Megohms	HP −400FL AC Voltmeter
Frequency Counter	Accuracy: ± 1 count including time base accuracy	NEC TTS 80C Frequency Counter
Oscillator	Frequency Range: 350 Hz to 450 Hz min. Min. Output Level Range: −43 dB to 0 dB Output Impedance: 600 ohms	HP 209A Oscillator
Oscilloscope	Vertical Sensitivity: 0.1 V/cm min. Sweep Speed: 10 us/cm min. Probe: X1	Tektronix 504
VOM	Max. Range dc Volts: 48 volts min. Accuracy: ± 1.5% of full scale. Input Impedance: 20K ohms/volt Max. Range dc Current: 22 mA min. Accuracy: 3.0% of full scale.	Triplett Model 630NA

5.14 To remove the Model 2765 completely from its case, proceed as follows:

a. Disconnect all cables from rear of Model 2765.

b. Perform step 5.13, a above.

c. Pull unit straight out of its case to stops then tilt unit upward and pull out of case completely.

5.15 **PREVENTIVE MAINTENANCE.**

5.16 Preventive maintenance for the Model 2765 consists of periodic cleaning of its air filter and calibration. The air filter should be cleaned at least once a month or sooner if the Model 2765 is operating in a dusty environment. Calibration should be performed at least once a year or every six months if the Model 2765 is moved often from one area to another.

5.17 Air Filter. The Model 2765 has a reusable aluminium mesh air filter that requires periodic maintenance. Every 30 days is recommended with more regular cleaning when the Model 2765 is operated in a dusty environment or when the filter is obviously in need of cleaning

CAUTION

A dirty air filter will cause overheating which can result in damage to Model 2765.

The air filter must be coated with an air filter adhesive after each cleaning for maximum filtering efficiency. This adhesive may be purchased in one pint aerosol cans from Northeast Electronics under NEC # 9201-00-500. It may also be available locally from retail electronic component or test equipment suppliers but the adhesive used should state that it meets federal specifications F-F-300A for filter adhesives. To clean the air filter, proceed as follows:

a. To obtain access to the air filter, perform steps a and b in paragraph 5.13.

b. The air filter is located on the right side when facing the unit. Remove air filter from Model 2765 by removing two retaining screws holding it to the chassis

c. Remove excess dust and lint by rapping filter with its dirty side down

d. Clean out remaining dust and lint by flushing filter with a stream of water from one side then the other. If the air filter is extremely dirty, wash in container filled with warm water and mild detergent then rinse clean and allow to dry.

e. Apply adhesive on dry filter by spraying the adhesive evenly, but lightly, on the intake side.

5.18 Calibration. It is recommended that the Model 2765 be calibrated at least once a year. If the Model 2765 is moved frequently it should be calibrated every six months. To calibrate the Model 2765 proceed to paragraph 5.83.

5.19 **TROUBLESHOOTING.**

5.20 To facilitate troubleshooting, the following Troubleshooting Guide is provided to assist the technician in isolating a Model 2765 problem to a detective printed circuit board (pcb) or other assembly in the Model 2765. The pcb or assembly can then be returned to Northeast Electronics for repair or replacement. Help in isolating the problem is also available from Northeast Electronics by calling the Customer Service Department, Refer to paragraph 5.3 for service information

5.21 Since all possible equipment failures cannot be covered, a good understanding of the theory of operation and circuit theory is useful prior to troubleshooting the Model 2765. This can be obtained by reading this manual and the CDA System manual. A broad range of problems and possible causes are provided by the Troubleshooting Guide covering most functions of the Model 2765. The Troubleshooting Guide covers possible problems related to:

a. Circuit access (CDA System will not access trunk)

b. 24 hour clock

c. Circuit number printout.

d. Supervision printout including 01 completed call disposition recognition (answer supervision).

e. Dialed number recognition including code tone recognition and end of dialing (EOD) within Model 2765

f. Disposition recognition

5.22 **TROUBLESHOOTING GUIDE.**

5.23 **CONSIDERATIONS PRIOR TO TROUBLESHOOTING.**

5.24 Prior to troubleshooting the Model 2765 note the following:

a. It is assumed that;

1. The Call Disposition Analyzer (CDA) System has been checked for proper interconnection, control settings, etc.

2. The CDA System Troubleshooting Guide located in Section Four of the CDA System instruction manual has been followed to isolate the problem(s) to the Model 2765.

b. The Model 2765 is energized as indicated by its lit POWER lamp.

c. It is recommended that the Model 2765 Program Analyzer (Program Analyzer) accessory be used for troubleshooting of the Model 2765. This accessory can be purchased from Northeast Electronics under NEC # 2765-51-900. Refer to paragraph 5.5 through 5.8 for Program Analyzer general description, installation, instructions and description of functions of its controls and indicators. In most cases the Program Analyzer is used as a bus monitor in the troubleshooting guide. In this case a VOM can be used if a Program Analyzer is not available. If a VOM is used, the appropriate pin number for the indicator referred to on the Program Analyzer must be located on jack XA1. This jack is shown in Model 2765 Overall Schematic Diagram located in Section Seven of this instruction manual. If the test calls for a lit indicator on the Program Analyzer, the voltage on its associated pin on jack XA1 should be 4.0 Vdc ±1.5 Vdc referenced to chassis of Model 2765. If the test calls for an extinguished indicator, the voltage should be 0.4 Vdc, ±0.4 Vdc.

d. Measure all power supply voltages (±15 Vdc and +5 Vdc) as a first step to troubleshooting any unit malfunction. If voltage is missing or needs adjustment, refer to unit power supply calibration in this section paragraph 5.85.

e. The unit uses transistor-transistor logic (TTL) When a high is referred to on a logic line a voltage of 4.0 Vdc ±1.5 Vdc should be measured. When a low is referred to, a voltage of 0.4 Vdc ±0.4 Vdc should be measured. Unless otherwise noted a measurement out of these limits indicates a malfunction at a source or termination of the measured logic line

5.25 **TROUBLESHOOTING CIRCUIT ACCESS PROBLEMS (SYSTEM WILL NOT ACCESS A CIRCUIT FOR OBSERVATION).**

5.26 If the trunk access unit is operational and wired correctly, only three conditions can prevent the trunk access unit from accessing a trunk. The following provides the three conditions and methods of verifying if any of the conditions exist when a Model 2776 or TN 76 Trunk Access unit is used in the CDA System:

a. A system reset problem that holds the trunk access unit in a reset mode. With a Model 2776 Trunk Access unit this problem is easily recognized because the Model 2776 RESET lamp remains lit. If a TN 76 Trunk Access unit is used in the CDA System, set TN 76 RUN-IDLE switch to RUN position then depress RESET pushbtton. The audible sound of a relay closing within the TN 76 should be heard. If not there is a reset problem.

b. A hold control problem that prevents the trunk access unit from accessing a trunk. When a Model 2776 Trunk Access unit is used in the CDA System, the problem can be detected by measuring the dc voltage on the HOLD lead from the Model 2765 when the Model 2765 CIRCUIT ACCESS lamp extinguished. To do this, use a VOM and monitor voltage between GND (+) and HOLD (-) lead terminals on rear of Model 2776. For location see exploded view in Figure 3–8. Voltage reading should be −48 Vdc ±4.0 Vdc. If a TN 76 Trunk Access unit is used in the CDA System, proceed as follows:

1. Remove Model 2765 from its case as described in paragraph 5.13.

2. Remove Output Buffer pcb A1A12 from Model 2765 and insert into extender card.

3. With Model 2765 Power switch in OFF position, insert pcb A1A12 and extender card into slot 12 of Model 2765 card cage.

4. Set Model 2765 Power switch to ON position.

5. With a VOM monitor voltage across pin three (-) and 22 (+) of A1A12, when Model 2765 CIRCUIT ACCESS lamp is extinguished. Voltage reading should be −48 Vdc ±4.0 Vdc

c. A trunk identification problem causing a continuous circuit access condition to be recognized by Model 2765. A trunk identification problem is usually identified by eliminating the first two possible causes mentioned above.

5.27 Troubleshooting A Reset Problem. The reset relay in the Model 2765 for the trunk access units is located on Output Buffer pcb A1A12 and is driven by the system reset logic line (SMR) from Special Function Generator pcb A1A13. This line is an inversion of $\overline{\text{SMR}}$ which can be driven by the Power Reset or Auto Reset circuits on pcb A1A13, IDLE switch on the front panel or, when Model 2765 is equipped with Option A, EXT RST from Input/Output Board pcb A19 of Option A.

5.28 Install Program Analyzer as described in paragraph 5.7 then proceed as follows:

a. Set Model 2765 POWER switch to ON position.

b. Set Model 2765 RUN/IDLE switch to RUN position.

c. Observe Program Analyzer indicators SMR, EXT, AUTO, and PWR.

5.29 If indicators SMR, EXT, AUTO, and PWR remain lit, troubleshoot the SMR bus from pcb A1A13 to A1A12.

5.30 If the SMR indicator is extinguished but EXT, AUTO and PWR indicators are lit, remove pcb A1A5, A1A8, A1A10 and, if Option A is used, pcb A21, one at a time while observing SMR indicator. If the SMR indicator lights after removing one of the above printed circuit boards, troubleshoot SMR bus to that printed circuit board.

5.31 If the SMR indicator remains extinguished after all the above printed circuit boards have been removed, check the RUN/IDLE switch and connections to pcb A1A13 and circuitry on pcb A1A13 relevant to $\overline{\text{SMR}}$ line. Normally, the SMR indicator extinguishes and the system is held reset only when the RUN/IDLE switch is in IDLE position.

5.32 If Program Analyzer PWR indicator is extinguished, observe the 1 SEC indicator. Since the 1 SEC signal drives the Power Reset circuit on pcb A1A13, the 1 SEC indicator must be pulsing for the Power Reset circuit to operate. If no pulsing is observed, troubleshoot 60 Hz input to pcb A1A13 from transformer T1 on rear assembly of Model 2765 and 1 Second Generator on pcb A1A13

5.33 If Program Analyzer 1 SEC indicator is pulsing and its PWR indicator is extinguished, observe the SMR indicator. If it is extinguished, troubleshoot Power Reset circuit on pcb A1A13. If it is lit, remove pcb A1A3, A1A19, A1A23, and A1A17 one at a time while

observing PWR indicator. If PWR indicator lights after removing one of the printed circuit boards above, troubleshoot PWR RST line from pcb A1A13.

5.34 If the Program Analyzer AUTO indicator is extinguished, observe the SMR indicator. If it is extinguished, troubleshoot Auto Reset circuit on pcb A1A13. If the SMR indicator is lit, remove A1A19, A1A23, and A1A15 one at a time while observing the AUTO indicator. If the AUTO indicator lights after removing any one of the above printed circuit boards, troubleshoot the AUTO RST line from that printed circuit board. If the AUTO indicator remains extinguished, troubleshoot the AUTO RST bus from pcb A1A13.

5.35 If Program Analyzer EXT indicator is extinguished, remove pcb A1A19 and A1A23 one at a time while observing EXT indicator. If it lights when pcb A1A19 or A1A23 is removed, troubleshoot the EXT RST line from that printed circuit board. If EXT indicator remains extinguished, troubleshoot the EXT RST bus from pcb A1A13

5.36 Troubleshooting a Hold Control Lead Problem. The Model 2765 hold circuit (Q1,Q2,Q3,CR7) is located on the Output Buffer pcb A1A12. When it is active it clamps the HOLD lead to the trunk access unit at approximately −20 Vdc. This prevents a circuit reaccess. The hold circuit is driven by the Model 2765 circuit access detected bus (CAD).

5.37 To troubleshoot the hold control lead problem proceed as follows

a. With its ENA toggle switch set away from ENA position, install Program Analyzer into slot one of Model 2765 card cage (refer to paragraph 5.7).

b. Set Model 2765 RUN/IDLE switch to IDLE position and observe Program Analyzer CAD indicator

c. If CAD indicator is lit and the HOLD lead from pcb A1A12 has a voltage appearing on it greater than −44 Vdc, troubleshoot the hold circuit on pcb A1A12

d. If the CAD indicator is extinguished, remove pcb A1A3, A1A7, A1A8, A1A12, A1A19, A1A23, A1A5, and A1A13 in the order given. Momentarily depress the Program Analyzer PWR RESET pushbutton after removal of each printed circuit board while observing the CAD indicator.

e. If the CAD indicator lights after removal of any one of the above printed circuit boards, troubleshoot the CAD bus from that printed circuit board.

5.38 Note that the CAD bus is brought LO by pcb A1A5 during a normal circuit access. CAD is brought LO by the PRNT bus from A1A23 through A1A13 when a power reset, time set, timers set, or 01 INHIBIT set is given. Note also that A1A13, A1A15 and A1A17 are the only printed circuit boards required to generate a power reset as activated by a power up of the Model 2765 or by the PWR RESET pushbutton on the Program Analyzer All other printed circuit boards can be removed. The pcb A1A12 is necessary if a printer is to receive data.

5.39 Troubleshooting a Trunk Identification Problem. The Model 2765 receives circuit number information for the Model 2765 Trunk Access unit via ST leads through cables W4 and W5 or from the Model TN 76 Trunk Access unit TEST lamp leads through cable W4. When an ST or Test lamp lead goes from −48 Vdc to ground potential the Model 2765 encodes that transition to binary coded decimal by one of the Circuit Input Buffer pcb A1A2, A1A4 or A1A6. Note that the early versions of the Model 2765 recognized only the removal of −48 Vdc from an ST or Test lamp lead as being the circuit accessed. The pcb A1A2 encodes circuits 1-30, A1A4 encodes 31-60, and A1A6 encodes 61-90. The bcd outputs of these printed circuit boards are bused together and the circuit number is latched into Circuit Access Detector A1A5 for printout.

5.40 A circuit access is recognized by Model 2765 only when the bcd of a circuit number appears on the MSD and/or LSD buses to pcb A1A5. The normal inactive voltage state of these buses is approximately 1.0 Vdc. The active voltage state is approximately −10 Vdc. In the early Model 2765 units, the active voltage state is approximately 0.5 Vdc. If any one of the MSD or LSD buses to pcb A1A5 is active when no circuit is shown to be accesssed by the Trunk Access unit, a faulty access unit, interconnection cable, pcb A1A2, A4, A6, or A5 exists and the Model 2765 will not receive the transition needed on the MSD and LSD buses to recognize a circuit access.

5.41 To isolate the problem to either the Model 2765 or interconnection cable(s) W4 and W5, proceed as follows

a. Set Model 2765 Power switch to OFF position

b. Remove Circuit Input Buffer pcb A1A2 from slot two of Model 2765 card cage

c. Insert pcb A1A2 into extender card and insert into slot two of card cage

d. Set Model 2765 POWER switch to ON position.

e. Set Model 2765 RUN/IDLE switch to RUN position

f. Refer to schematic diagram of pcb A1A2 Section Seven. With no circuit accessed by the trunk access unit (TEST lamp lit), check voltage appearing on the thirty circuit number inputs with a VOM. Each input should have −48 Vdc ± 5.0 Vdc. If more than one trunk access unit is used in CDA System check input voltages to pcb A1A4 A1A6 in the same manner.

g. If any circuit number input has less than −43 Vdc, the problem lies in the access unit or its interconnection to the Model 2765. If all circuit number inputs have proper voltage, troubleshoot pcb A1A2 and, if used pcb A1A4 and A1A6, and pcb A1A5.

5.42 To troubleshoot pcb A1A2 (A4 or A6) and A1A5, proceed as follows:

a. With no trunk accessed by trunk access unit (no TEST lamp lit on access unit) check each MSD and LSD bus from pcb A1A2 (if used A1A4 or A1A6) and pcb A1A5. The voltage should be 1.0 Vdc ±0.2 Vdc.

b. If all MSD and LSD buses have the proper voltage, troubleshoot pcb A1A5.

c. If any bus does not have 1.0 Vdc ±0.2 Vdc, remove pcb A1A2 (if used A1A4 and A1A6) one at a time while monitoring the bus in question. If the monitored voltage returns to normal after removing any one of the above printed circuit boards, troubleshoot that printed circuit board. If the monitored voltage does not return to normal (1.0 Vdc ±0.2 Vdc), troubleshoot pcb A1A5.

5.43 TROUBLESHOOTING 24 HOUR CLOCK PROBLEMS.

5.44 There are two functions associated with the clock that are independent of each other, therefore, clock problems can be broken down into the following:

a. Clock does not keep correct time (gains, loses, or is erratic).

b. Clock cannot be set correctly from the front panel (clock printout does not agree with HRS, MIN, thumbwheel settings) or, no printout occurs when SET CLOCK pushbutton is depressed in an attempt to set the clock

5.45 Troubleshooting a Time Keeping Problem. The Model 2765 24 Hour Clock circuit is located on pcb A1A3 and is driven by a time keeping signal having a period of one second. This is derived from the 1 Second Generator on pcb A1A13 which is driven from the 60 Hz ac power input to the Model 2765 through transformer T1 located on the rear panel assembly. Gains or losses of five minutes per day can be typical and does not indicate a clock problem.

5.46 Install Program Analyzer as described in paragraph 5.7 then proceed as follows:

a. Set Model 2765 RUN/IDLE switch to IDLE position.

b. Set Model 2765 POWER switch to ON position.

c. Observe Program Analyzer 1 SEC indicator. It should briefly extinguish at one secons intervals. If it does, troubleshoot pcb A1A3. If the rate is too fast, slow, intermittent or not at all, remove pcb A1A3, A1A7, A1A16, and A1A27 one at a time while observing the 1 SEC indicator. If the 1 SEC indicator extinguishes at the proper rate after removing one of the above printed circuit boards, troubleshoot the 1 SEC bus into that printed circuit board. If the 1 SEC indicator does not operate properly after removing all the above boards, troubleshoot pcb A1A13 and 60 Hz input from transformer T1.

5.47 Troubleshooting Set clock Problems. When depressed, the Model 2765 SET CLOCK pushbutton activates the Set Clock circuitry on pcb A1A23 but only when there is no circuit accessed as indicated by the extinguished Model 2765 CIRCUIT ACCESS lamp, and no data is being transmitted to the printer. The Set Clock circuitry determines that there is no circuit accessed by monitoring a LO on the CAD bus. It determines that there is no data being transmitted by monitoring a HI on the TTY bus. When the SET CLOCK pushbutton is depressed and is recognized by pcb A1A23, the $\overline{\text{PRNT}}$ bus is brought LO by pcb A1A23 This prepares the Model 2765 to enter the new time data into it's First-In First-Out memory on pcb A1A17 The CLK ENA bus is brought LO by pcb A1A23 and allows pcb A1A3 to recognize the new time set on the front panel HRS, MIN thumbwheels.

5.48 If the printout does not agree with the HRS, MIN thumbwheel switch settings, troubleshoot the bcd code routed to pcb A1A3 from the thumbwheel switches. A HI is represented by a voltage of 2.0 Vdc ±0.5 Vdc into pcb A1A3. A LO is represented by 0.4 Vdc ±0.4 Vdc The code logic levels should be measured on the bcd lines from the thumbwheel switch(es) associated with

the programmed characters not being printed out correctly. If the bcd code voltage conditions are correct, troubleshoot pcb A1A3. If the voltages are incorrect, the problem lies in the thumbwheel(s) on pcb A1A31A2 or bcd line conditions to pcb A1A3 from pcb A1A31A2 via pcb A1A30 and cable W1 (See Overall Schematic in Section Seven).

5.49 If the Model 2765 SET CLOCK pushbutton is depressed but the SET CLOCK reminder lamp does not stop flashing, troubleshoot the SET CLOCK pushbutton and pcb A1A23.

5.50 TROUBLESHOOTING CIRCUIT NUMBER PRINTOUT PROBLEMS.

5.51 A circuit number printout problem usually consist of either incorrect circuit number printout or no number printout.

5.52 Troubleshooting a Wrong Circuit Number Printout. It should be remembered that the bcd of the circuit number appears on the LSD and MSD inputs of pcb A1A5. The bcd data is provided by pcb A1A2 or, if used, pcb A1A4 or A1A6. To troubleshoot a wrong circuit number printout, proceed as follows:

a. Remove 24 Hour Clock pcb A1A3.

b. Manually access the circuit in question by depressing the associated Model 2776 Trunk Access unit TEST lamp or, if using a TN 76, set the associated CKT ACCESS key switch in the down position.

c. Determine the trunk number appearing in bcd on LSD and MSD buses into pcb A1A5 (Refer to paragraphs 5.41 and 5.42). A LO logic level should be 1.0 Vdc ± 0.2 Vdc. A HI should be −10 Vdc ± 1.0 Vdc or 0.5 Vdc ± 0.2 Vdc in older units. If the bcd of the trunk number is correct, troubleshoot pcb A1A5. If it is incorrect, troubleshoot pcb A1A2 (if used A1A4 and A6) and interconnection cable(s) to trunk access unit.

5.53 Troubleshooting a No Circuit Number Printout. When Circuit Access Detector pcb A1A5 receives an address on the Function Address Bus (FAB) a data ready ($\overline{\text{DRDY}}$) command is automatically given by pcb A1A5. If the printout is 00 for a circuit number, troubleshoot as a wrong circuit number printout (Refer to paragraph 5.50 through 5.52). If there is no printout, troubleshoot the Write Circuit Number Control circuitry on pcb A1A5. It should provide the $\overline{\text{DRDY}}$ command

5.54 TROUBLESHOOTING SUPERVISION PRINTOUT PROBLEMS INCLUDING 01 COMPLETED CALL DISPOSITION RECOGNITION PROBLEMS (ANSWER SUPERVISION).

5.5 Supervision printout or recognition problems are usually a result of a defective display interface pcb A1A8 or A1A10, Supervision Detector pcb A1A7 or Dialed Number Organizer pcb A1A9. The problems will be evident by one of the following symptoms:

a. Originating supervision printout is not correct.

b. No originating supervision printout.

c. No answer supervision recognized or recognized when not present (01 disposition problems)

5.56 Troubleshooting Incorrect supervision Printout. Incorrect supervision printout is usually a result of more than one of pcb A1A7 inputs E, M, LP, and TR going LO at the time the first dialed number or code tone is recognized, or none of these leads are LO at the time of the first dialed number.

5.57 To troubleshoot incorrect supervision printout, proceed as follows:

a. If Model TTS 2761 or TTS 2762 display unit is used, remove pcb A1A10. If Model TTS 76 display unit is used, remove pcb A1A8.

b Observe a few calls. Note that when pcb A1A8 is removed, the Model 2765 must be manually reset via its RUN/IDLE switch.

c. If the problem is corrected, troubleshoot the supervision input leads E, M, LP, and TR on the removed printed circuit board. When Model TTS 2761 or TTS 2762 display unit is used in the CDA System, pcb A1A10 is not necessary in the Model 2765 for proper operation

d. If supervision printout is not corrected by the above procedure, proceed as follows

1. Check logic levels of supervision lead inputs E, M, OFF HOOK and LINE REVERSE on the display interface pcb in question. The inactive state for the supervision lead inputs to pcb A1A8 is LO Except for the LINE REVERSE input which is −30 Vdc ±4.0 Vdc, the inactive state of the supervision lead inputs to pcb A1A10 is −48 Vdc ±4.0 Vdc

2. Observe the display unit supervision lamps. The supervision lead inputs should indicate an inactive state when the assosicated supervision observed is inactive. Otherwise, troubleshoot the associated interconnection cable to the CDA System display unit.

3. If voltage level on all supervision lead inputs to display interface pcb are correct, check the display interface pcb supervision lead outputs. The inactive state of these outputs should be HI. If all leads have proper voltage levels in an inactive state, troubleshoot pcb A1A7. If any lead has an incorrect voltage, troubleshoot that lead on the display interface pcb.

5.58 Troubleshooting No Supervision Printout. Before supervision can be printed, a dialed number or code tone must be recognized by pcb A1A9 as indicated by a LO on dial number latch ($\overline{DNL}$) output of pcb A1A9. Therefore, a dialed number recognition problem could cause no supervision to be printed.

5.59 To troubleshoot no supervision printout, proceed as follows:

a. If the dialed number is printed but not the supervision, troubleshoot Supervision Detector pcb A1A7.

b. If the dialed number is not recognized, place pcb A1A7 on the extender board and check its $\overline{DNL}$ input. It should be LO as soon as a dialed number is displayed on the signal display unit in the CDA System. If $\overline{DNL}$ input does go LO, troubleshoot pcb A1A7. If it does not go LO, the dialed number is not being recognized. Refer to Troubleshooting Dial Number Recognition Problems to Include Code Tone Recognition and EOD (End of Dial) Recognition Within Model 2765 paragraph 5.62.

5.60 Troubleshooting Answer Supervision Problems (01 Disposition). An answer supervision is detected by Supervision Detector pcb A1A7 which in turn drives the $\overline{ANS}$ bus to Test Results Organizer pcb A1A11 LO. Answer is normally detected by pcb A1A7 when both its $\overline{E}$ and $\overline{M}$ inputs go LO and its $\overline{L}$ and $\overline{TR}$ are HI or, when $\overline{TR}$ and $\overline{L}$ are LO and $\overline{E}$ and $\overline{M}$ are HI. Conditions on the supervision inputs to pcb A1A7 other than the two mentioned above will prevent answer detection on pcb A1A7

5.61 Install Program Analyzer as described in paragraph 5.7 then proceed as follows:

a. Set Model 2765 RUN/IDLE switch to RUN position.

b. Set Model 2765 POWER switch to ON position

c. Observe the Program Analyzer indicator OH. This indicator monitors the $\overline{ANS}$ bus from pcb A1A7. If indicator OH is extinguished when no circuit is accessed, remove pcb A1A11. If the indicator remains extinguished, troubleshoot pcb A1A7. If it lights troubleshoot pcb A1A11.

d. If the OH indicator is lit when no circuit is accessed, let a circuit access the CDA System Observe the OH indicator. If it extinguishes when the call is answered and 01 disposition is not detected, troubleshoot pcb A1A11. If OH indicator remains lit when the call is answered and answer detection conditions are met as described in paragraph 5.60, troubleshoot supervision lines from signal display unit to interface pcb and to pcb A1A7 as described in paragraphs 5.56 and 5.57.

5.62 TROUBLESHOOTING DIALED NUMBER RECOGNITION PROBLEMS INCLUDING CODE TONE RECOGNITION AND EOD (END OF DIALING) RECOGNITION WITHIN MODEL 2765.

5.63 Problems involving dialed number recognition, Code Tone Recognition, and EOD recognition can be identified by the following:

a. One or more code tones are not recognized.

b. Dialed number is not recognized.

c. Dialed number is recognized but not correctly (wrong number printed).

d. End of dialing (EOD) is not recognized or recognized prematurely (Asterisk printed before dialed number has been printed).

5.64 Troubleshooting Code Tone Recognition Problems. All code tone data signal paths are from the display unit to the Model 2765 display interface, pcb A1A8 or A10, then to pcb A1A9. Dialed Number Organizer pcb A1A9 must generate a LO on $\overline{DNL}$ bus before the code tone is printed (Refer to paragraph 5.58).

5.65 Troubleshoot the appropriate code tone logic bus and $\overline{DNL}$ bus as outlined in paragraphs 5.56 through 5.59. If code tone logic buses activate normally, troubleshoot pcb A1A9. If both code tone and $\overline{DNL}$ buses activate normally, troubleshoot pcb A1A7

5.66 Troubleshooting Dialed Number Recognition. Dialed number data signal paths are routed through the same printed circuit boards as for code tone data. The number appears at display interface pcb A1A8 in binary coded decimal from a Model TTS 2761 or 2762 and in decimal at display interface pcb A1A10 from a Model TTS 76 signal display unit. The difference between recognition of code tone and dial number lies with the DATA PRESENT command from the signal display unit. The Model 2765 must receive a DATA PRESENT command in order to recognize a dialed number.

5.67 Refer to paragraphs 5.58 and 5.59 and troubleshoot $\overline{DNL}$ bus.

5.68 Troubleshoot display interface pcb DATA PRES input and $\overline{LTCH}$ output. They should be momentarily active during each dialed number display.

5.69 Troubleshooting Incorrect Dialed Number Printout. To troubleshoot incorrect dialed number printout, proceed as follows:

a. If a Model TTS 2761 or 2762 signal display unit is used, remove TTS 76 Interface pcb A1A10 and observe a few calls. If this solves the problem, pcb A1A10 is defective. Note that pcb A1A10 is not necessary for Model 2765 operation when a Model 2761 or 2762 is used in the CDA System.

b. If a Model TTS 76 display unit is used, remove pcb A1A8 and observe a few calls. The Model 2765 must be reset by its RUN/IDLE switch after the dialed number is received. If the problem is corrected, pcb A1A8 is defective.

c. Troubleshoot dialed number bcd code lines from display unit, through the display interface to pcb A1A9. If a code line must be activated to determine location of a problem, this can be done when using Model TTS 76 display unit by either:

1. Applying a continuous MF tone into the display unit via an external test set such as the Northeast Electronics Model TTS 59 or, ...

2. Applying a ground to one of the dialed number (DN) inputs to pcb A1A10.

If a code line must be activated into pcb A1A8, an external test set will be required along with an oscilloscope to monitor the MF code inputs to pcb A1A8. The code will be active into pcb A1A8 for approximately 25 milliseconds as it is displayed on the signal display unit. If there are no problems monitored on code lines to display interface, troubleshoot pcb A1A9

5.70 Troubleshooting EOD Problems. when dial pulse signaling is monitored, the signal path within the Model 2765 to generate an EOD is through pcb A1A8 to pcb A1A13 via dial pulse ($\overline{DP}$) bus. When MF dialing is monitored. the signal path is through pcb A1A13 by recognition of an ST or ? address code appearing on the Word Address Bus (WAB). In either case, one-shot U2B on pcb A1A13 must be triggered to set U4A on pcb A1A13.

5.71 If EOD is recognized too soon when monitoring loop dial pulsing, potentiometer R26 on pcb A1A13 might have to be adjusted. This adjustment controls amount of time Model 2765 will wait between dial pulses (interdigit time) before recognizing EOD Potentiometer R26 is factory set to provide an interdigit time of approximately 1.5 seconds. Due to delay in dialing commands from terminating offices, potentiometer R26 might have to be set to provide a longer interdigit time. Rotating potentiometer R26 clockwise increases interdigit time. This time is set to a minimum while still allowing recognition of a complete dialed number (address). For adjustment procedure refer to calibration of pcb A1A13 paragraph 5.90.

5.72 DISPOSITION RECOGNITION PROBLEMS.

5.73 Problems related to detection of correct call disposition can be due to one or more of the following

a. CDA not detecting audible tones on monitored trunk.

Symptoms: 02,03, and 04 dispositions are printed 06,08, or 00.

b. CDA not detecting supervision data correctly from signal display unit.

Symptoms: 01 dispositions are printed 04, 05, or 06. 07 dispositions are printed 00

c. CDA disposition timers not operating properly Symptoms: 04 dispositions are printed 08 or vice versa or there is no disposition printout

5.74 Troubleshooting Audible Tone Detection Problems. The circuit under test is bridged directly by Model 2765 via its L1 and/or L2 input jack(s). The L1 jack is used when monitoring 2-wire circuits Both L1 and L2 jacks are used when monitoring 4-wire circuits The channel (L1 or L2) selected to monitor audible tones by Model 2765 is determined by originating supervision appearing on the monitored circuit For loop circuits (L supervision) L1 is selected. For E seized circuits (E supervision) L1 is selected. For M seized circuits (M supervision) L2 is selected. The line bridging and

channel selecting circuits are located on Model 2765 pcb A1A14 along with amplifiers and a band pass filter. The output of pcb A1A14 is applied to the tone detector on pcb A1A16. Channel control is accomplished on pcb A1A14 via monitored supervision data from the signal display unit which is routed through display interface pcb A1A8 or A1A10.

5.75 To troubleshoot audible tone detection problems, proceed as follows:

a. Install Program Analyzer as described in paragraph 5.7.

b. Monitor audible tone on circuit under test via signal display unit speaker.

c. Observe LED CR7 on pcb A1A16 during a call having audible tone (ringback, busy or reorder). The LED should be normally lit and extinguish with tone recognition. If LED does not extinguish with tone, observe Program analyzer EOD indicator. It should be extinguished with tone recognition. If EOD indicator is not extinghished, refer to paragraph 5.69 and 5.70.

d. If EOD indicator is extinguished and LED CR7 on pcb A1A16 does not extinguish when tone is present, place pcb A1A16 on extender card and, with an oscilloscope, monitor Interconnection Board A1A30 jack XA16 pin 6.

e. The tone waveform should be present. If tone is not present, troubleshoot pcb A1A14 and channel select E-LP and M inputs to pcb A1A14. To gate an audible tone appearing on L1 input jack to pcb A1A16, E-LP input must be HI. To gate tone appearing on L2 input jack, M input must be HI. If tone waveform is present at pin 6 of XA16 jack, troubleshoot Tone Detector on pcb A1A16.

f. Check quick connect pin strapping on pcb A1A14. Pin A should be strapped to pin CE and pin A1 to pin CM.

g. If LED CR7 on pcb A1A16 follows input tones intermittently, tone levels on monitored circuit might be too low (see Input Characteristics for L1 and L2 in Section Two) or pcb A1A14 and A1A16 need adjustment. Refer to calibration procedures for pcb A1A14 and A1A16.

h. If LED CR7 on pcb A1A16 follows input tones correctly, but 06 or 08 disposition is printed instead of an 04, observe Program Analyzer RB indicator. It is normally lit and extinguishes when audible ring on monitored circuit is detected by Model 2765. On pcb A1A16, LED CR7 must extinguish for at least approximately one second and lit for approximately one second (see Tone Detection Audible Ring specification in Section Two). If it does and RB indicator does not extinguish, troubleshoot Audible Ring Detector on pcb A1A16. If it does and RB indicator extinguishes, troubleshoot pcb A1A11 and disposition timers (Refer to paragraph 5.81 and 5.82 for troubleshooting disposition timers).

i. If LED CR7 on pcb A1A16 follows input tones correctly, but 08 or 00 disposition is printed instead of 02 and 03, observe several calls terminating with a reorder and/or busy tone. If tone level, interruption period, or duty cycle is out of range of Model 2765 detectors, it is normal for Model 2765 to recognize an 00 disposition in place of a busy (02) or reorder (03) disposition. (See Section Two for busy and reorder tone detection specifications). A calling party disconnect on a busy or reorder tone before Model 2765 detectors recognize the disposition can also cause a 00 disposition printout.

j. If no busy or reorder dispositions are recognized by Model 2765 and the LED CR7 on A1A16 follows the tone, troubleshoot pcb A1A20 and pcb A1A11. If busy and reorder dispositions are being recognized intermittently by Model 2765, This could be caused by interruption period and/or duty cycle of some tones appearing out of Model 2765 specifications (See Section Two for busy and reorder tone detection specifications).

5.76 Troubleshooting 01 and 07 Disposition Problems. A Complete Call (01) disposition is recognized by Model 2765 when answer supervision appears on circuit under test. Tone recognition is not required for this disposition. Refer to paragraphs 5.60 and 5.61 for 01 disposition troubleshooting.

5.77 A Sender Retrial (07) disposition is recognized by Model 2765 when the following conditions exist:

a. No dialed number is given after circuit seizure for at least five seconds, and

b. Circuit seizure information is removed from circuit before five seconds has elapsed after seizure or, both circuit seizure and answer supervision are given for at least five seconds after seizure (dual seizure or glare condition on circuit)

5.78 Logic to determine if the above conditions exist is located on pcb A1A7. Originating Supervision Detector pcb A1A7 monitors supervision lines via its inputs E,M,

LP and TR from display interface pcb A1A8 or A1A10. So troubles with 07 dispositions will indicate problems with correct supervision and answer supervision detection (01 disposition). Refer to paragraph 5.54 to troubleshoot supervision problems.

5.79 If correct originating supervision is detected when dialed number is received and 01 disposition is detected and printed, the problem lies on pcb A1A7 or A1A11.

5.80 To verify correct detection of 07 disposition by pcb A1A7, place pcb A1A7 on extender card and measure voltage on Interconnection Board A1A30 jack XA7 pin 17 during conditions for an 07 disposition. An 07 disposition condition can be simulated by depressing and releasing a TEST pushbutton switch on Model 2776 access unit or by momentarily operating one of the BUSY switches to the down position on a Model TN 76 access unit. The logic level appearing on jack XA7 pin 17 should initially be HI and go LO for approximately one second after approximately four seconds has elasped from a circuit access. If these conditions do not exist on pin 17, troubleshoot pcb A1A7. If they do, troubleshoot pcb A1A11.

5.81 Troubleshooting Disposition Timer Problems. The Disposition Timers are three count down counters located on pcb A1A25. When pcb A1A23 Set Timers circuit is enabled, Disposition Timers are programmed to a given number of seconds determined by setting on front panel thumbwheel switches T1, T2, and T3. The Set Timers circuit is identical to Set Clock circuit on pcb A1A23 as discussed in paragraph 5.47.

5.82 If timers do not seem to count down properly, install Program Analyzer into Model 2765 as described in paragraph 5.7, then proceed as follows:

a. Set Model 2765 POWER switch to ON position.

b. While Model 2765 is monitoring a call, observe Program Analyzer indicators T1, T2, and T3. After the dialed number is printed, an asterisk should be printed to indicate end of dialing (EOD) has been detected by Model 2765. Program Analyzer EOD indicator should extinguish. This indicates timers are counting. If EOD indicator does not extinguish, refer to troubleshooting EOD problems in paragraph 5.70 and 5.71. Program Analyzer 1 SEC indicator must also briefly pulse on at one second intervals. If it does not pulse, refer to paragraph 5.45 for troubleshooting a time keeping problem.

c. Using the program Analyzer 1 SEC indicator as a reference, compare time it takes for each indicator T1, T2, and T3 to extinghish. Note that time T3 must be set to longer time or higher number on T3 thumbwheel switch than T1 or T2 for this observation. If T1, T2, or T3 indicator does not extinguish or does not extinguish at the proper time, the problem lies on pcb A1A25 or in disposition Timers Timeout Latch circuitry on pcb A1A23. Note that a disposition will be printed immediately upon normal conditions. If it does and a disposition is not printed, troubleshoot pcb A1A11.

d. To determine if pcb A1A23 or A1A25 is defective, proceed as follows:

1. Place pcb A1A23 on extender card provided with unit and insert into slot 23 of Model 2765 card cage.

2. With a VOM, check voltage on pcb A1A23 CLK 1, CLK 2, or CLK 3 input, depending on whether T1, T2, or T3, respectively, has the problem. The VOM should indicate an initial low logic voltage level. Then, upon time-out of counter being checked, input should go to a high logic voltage level. If the high pulse appears at the correct time, troubleshoot pcb A1A23. If it does not appear, or appears at the wrong time, troubleshoot pcb A1A25.

5.83 CALIBRATION.

5.84 The following procedures allow calibration of individual printed circuit boards and power supply assembly after repair or for complete calibration of Model 2765 (Refer to paragraph 5.12 for access to Model 2765 printed circuit boards).

5.85 POWER SUPPLY.

5.86 Calibration of +5 Vdc Output of Power Supply Assembly. Set +5 Vdc over voltage protection (OVP) as follows:

a. Connect VOM to +5V and GND test points located on bottom of Interconnection Board A1A30 toward front of unit.

b. Set +5 OVP Adj. potentiometer to full counter-clockwise position. See Figure 5-2 for location of potentiometers.

c. Set +5 Vdc Adj. potentiometer to obtain +6 Vdc ± 0.1 V dc reading on VOM.

d. Turn +5 OVP Adj. potentiometer slowly clockwise until 6 volts drops to approximately 1.0 Vdc.

e. Set Model 2765 POWER switch to OFF position

5.87 Set +5 Vdc output of power supply as follows:

a. Turn +5 Vdc Adj. potentiometer to full counterclockwise position.

b. Set Model 2765 POWER switch to ON position.

c. Turn +5 Vdc Adj. potentiometer clockwise until +5 Vdc ±0.1 Vdc reading is obtained on VOM.

d. Disconnect VOM test lead Interconnection Board A1A30.

5.88 Calibration of ±15 Vdc Outputs of Power Supply Assembly. Set ±15 Vdc overvoltage protection as follows:

a. Connect VOM to +15 V and GND test points located on bottom of Interconnection Board A1A30 toward front of unit.

b. Set ± 15 VOP Adj. potentiometer to full counterclockwise position. See Figure 5–2 for potentiometer location.

c. Set +15 Vdc Adj. potentiometer to obtain +18 Vdc ±0.1 Vdc reading on VOM.

d. Disconnect VOM from +15 V test point and connect to −15 V.

e. Set −15 Vdc Adj. potentiometer to obtain −18 Vdc ± 0.1 Vdc reading on VOM.

f. Turn ±15 VOP Adj. potentiometer slowly clockwise until −18 volts drops to approximately −1.0 Vdc.

g. Set Model 2765 POWER switch to OFF position.

5.89 Set ± 15 Vdc outputs of power supply assembly as follows:

a. Turn + 15 Vdc and −15 Vdc Adj. potentiometers to full counterclockwise position.

b. Set Model 2765 POWER switch to ON position.

c. Turn −15 Vdc Adj. potentiometer clockwise until −15 Vdc ± 0.1 Vdc reading is obtained on VOM

d. Disconnect VOM test lead from −15 V test point and connect to +15 V test point.

e. Turn +15 Vdc Adj. potentiometer clockwise until +15 Vdc ± 0.1 Vdc reading is obtained on VOM.

f. Disconnect VOM leads from Model 2765.

5.90 **SPECIAL FUNCTION GENERATOR PCB A1A13.**

5.91 To calibrate pcb A1A13, proceed as follows:

a. With Model 2765 POWER switch in OFF position remove pcb A1A13.

b. Insert pcb A1A13 into extender card and insert into card cage slot 13.

c. Remove pcb A1A8 and A1A9

d. Connect oscilloscope to test point TP2 of pcb A1A13 with reference to ground.

e. Set Model 2765 POWER switch to ON position.

f. Set oscilloscope to trigger and display a positive going waveform with a duration of approximately 1.5 seconds.

g. While observing oscilloscope, momentarily ground test point TP1 of pcb A1A23 to Model 2765 chassis with a test lead. Each time TP1 is grounded a positive pulse with approximately 4 Vdc amplitude will appear at TP2.

h. Adjust R26 on pcb A1A13 until 4 volt pulse has approximately 1.5 second duration. This adjustment is not critical for unit operation.

i. Set POWER switch to OFF position.

j. Disconnect all test equipment from Model 2765; remove extender and install pcb A1A13 into slot 13; insert pcb A1A8 and A1A9 into their respective slots.

5.92 **OUTPUT BUFFER PCB A1A12 (20 MA CURRENT).**

5.93 Calibrate 20 mA output of Output Buffer pcb A1A12 as follows:

a. Set POWER switch to OFF position and remove pcb A1A12.

b. Insert pcb A1A12 into extender and then insert into card cage slot 12.

c. With TTY cable W1 disconnected from printer, connect a VOM, set to monitor 20 mA dc, in series with yellow (+) and black (−) leads of TTY Cable W1. This cable is connected to jack J6 in rear of Model 2765.

d. Set POWER switch to ON position.

e. Adjust R6 on pcb A1A12 for a meter reading of 21 mA dc ± 1.0 mA dc.

f. Set POWER switch to OFF position.

g. Disconnect VOM from Model 2765; connect TTY Cable W1 to printer; remove extender and insert pcb A1A12 into slot 12.

5.94 **DATA CONTROL PCB A1A17.**

5.95 Calibrate 110 Hz data oscillator (9.09 ms Generator) on pcb A1A17 as follows:

a. Set POWER switch to OFF position.

b. Insert pcb A1A17 into extender then insert into card cage slot 17.

c. Set POWER switch to ON position.

d. Using a frequency counter, monitor pcb A1A17 pin V with reference to ground.

e. Adjust potentiometer R21 on pcb A1A17 for a frequency reading of 109.5 Hz ± 0.3 Hz. This adjustment is critical for unit operation.

f. Set POWER switch to OFF position.

g. Disconnect frequency counter from Model 2765; remove extender and insert pcb A1A17 into slot 17

5.96 **TONES AND RINGBACK DETECTOR PCB A1A16. (9700—96506 Version).**

5.97 To calibrate Tone Detector on pcb A1A16, proceed as follows

a. Set Model 2765 POWER switch to OFF position and remove pcb A1A16.

b. Insert pcb A1A16 into extender then insert into card cage slot 16.

c. Set POWER switch to ON position.

d. Remove all patch cords from signal display unit used in the CDA System.

e. Set up signal display unit to monitor MF signaling on E and M supervised trunks.

f. Insert a 310 patch cord into LINE or E jack of signal display unit and connect a lead from ground to tip on other end of 310 patch cord. Supervision indicator E should light on signal display unit.

g. Connect a lead from ground to pin 10 of pcb A1A16.

h. Remove patch cord from Model 2765 L1 jack.

i. Patch output of a sinewave oscillator into Model 2765 L1 jack.

j. Set output of oscillator to provide 400 Hz ± 50 Hz at minimum amplitude.

k. Monitor test point TP1 on pcb A1A16 with an AC Voltmeter (input impedance ⩾ 10 Megohm).

l. Slowly increase amplitude of oscillator output until no further signal level increase occurs in AC Voltmeter reading. Note this signal level reading.

m. Decrease oscillator output unitl AC Voltmeter reading is 1.5 dB less than noted reading in previous step.

n. Observe LED CR7 on pcb A1A16. If it is lit, slowly turn potentiometer R10 clockwise until it just extinguishes. If LED CR7 is extinguished, turn potentiometer R10 counterclockwise until it lights Then slowly clockwise until it just extinguishes.

o. Set Model 2765 POWER switch to OFF position.

p. Disconnect all test equipment from Model 2765 and connect all patch cords previously used in CDA System.

q. Remove extender card and insert pcb A1A16 into slot 16

5.98 **TONES DETECTOR PCB A1A18 (9700—96342).**

5.99 Calibration procedure of Tones Detector on pcb A1A18 is the same as described for pcb A1A16 except A1A18 is under test and DS1 indicator is monitored instead of CR7.

5.100 **TONES FILTER PCB A1A14.**

5.101 Calibrate pcb A1A14 range of tone sensitivity as follows:

a. Perform calibration steps described in paragraph 5.97, a through j.

b. Connect an AC Voltmeter to signal oscillator output.

c. Adjust oscillator output amplitude for a −43 dBm ± 0.1 dBm (600 ohm impedance) reading on AC Voltmeter.

d. Observe LED CR7 on pcb A1A16. If it is lit, slowly turn potentiometer R33 clockwise until LED CR7 just extinguishes. If LED CR7 is extinguished, slowly turn potentiometer R33 counterclockwise until LED CR7 lights. Then slowly turn R33 clockwise until it just extinguishes.

e. Adjust oscillator output amplitude for a 25 dBm ± 0.1 dBm (600 ohm impedance) reading on AC Voltmeter.

f. Observe LED DS1 on pcb A1A18 and repeat step d, adjusting potentiometer R34 on pcb A1A18.

g. Set Model 2765 POWER switch to OFF position.

h. Disconnect all test equipment from Model 2765 and connect all patch cords used in CDA System.

i. Remove extender card and insert pcb A1A16 into slot 16.

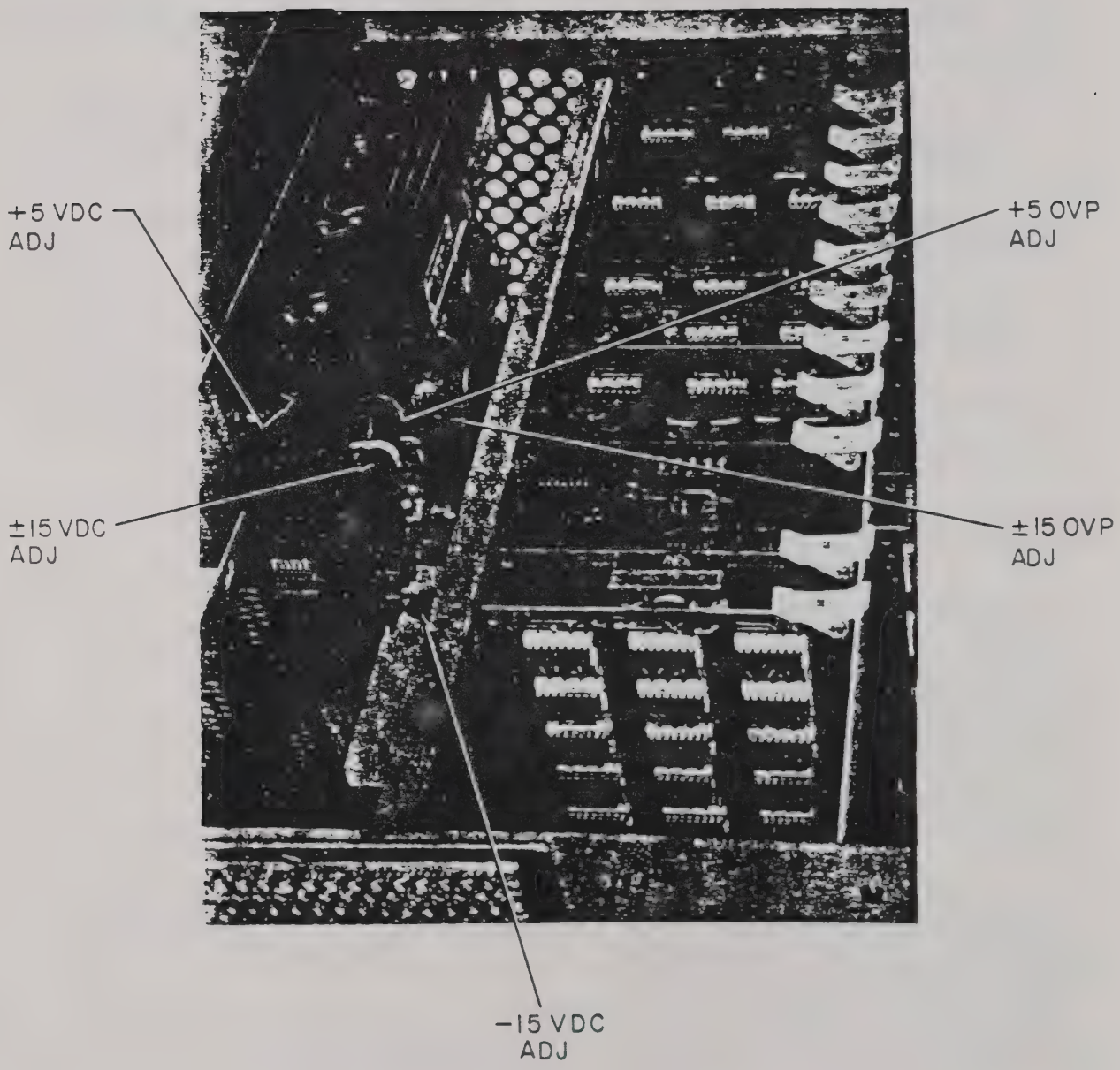
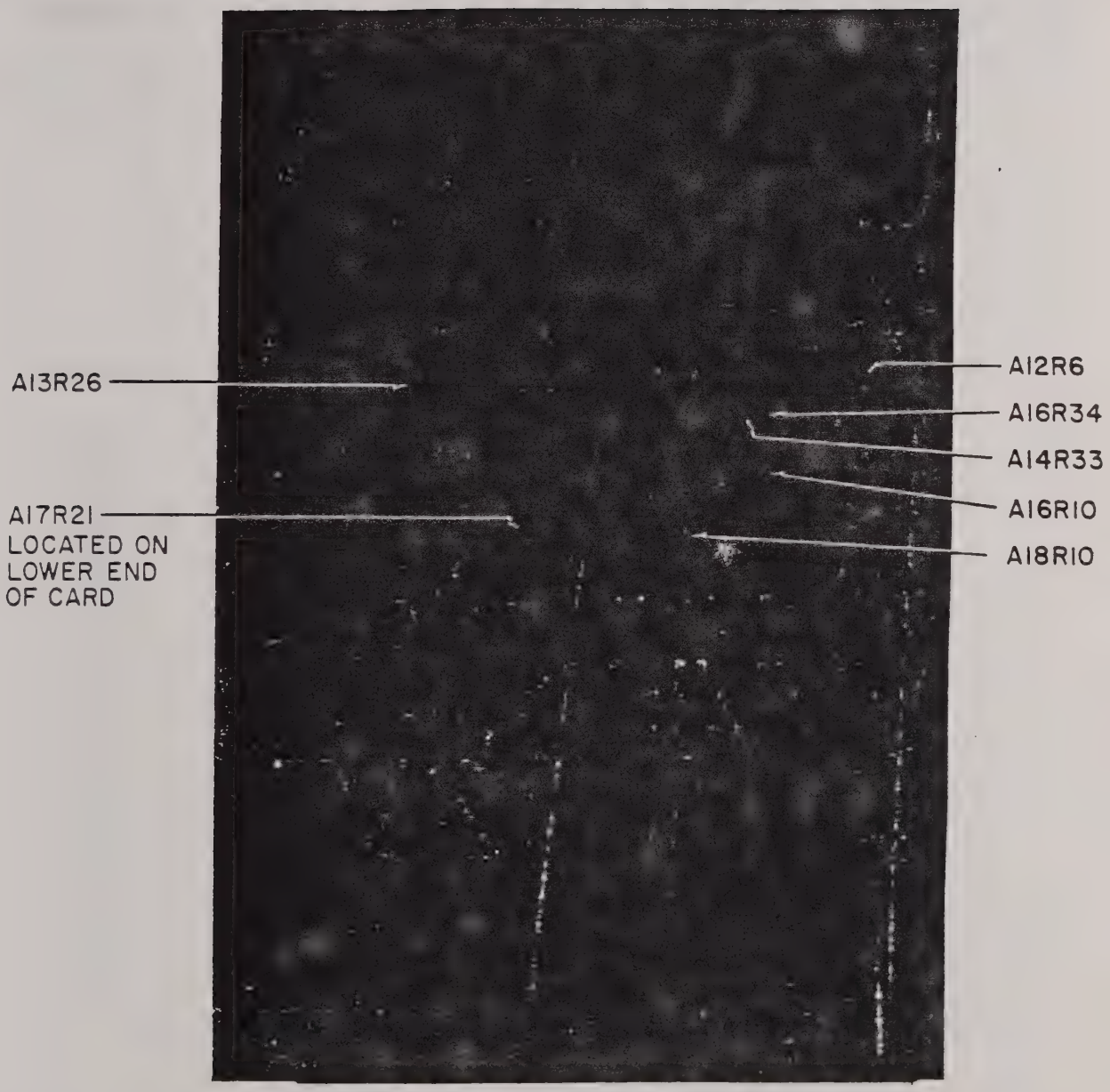


Figure 5−2. Model 2765 Locations of Power Supply Calibration Controls.



NOTE: PREFIX REFERENCE DESIGNATORS WITH A1.

Figure 5—3. Model 2765 Locations of Printed Circuit Calibration Controls.

SECTION 6

ELECTRONIC PARTS LIST

6.1 **INTRODUCTION.**

6.2 This section provides parts lists and associated component location drawings for easy location and identification of parts. Table 6 – 1 provides a list of FSCM (Federal Supply Code of Manufacturers) code numbers with corresponding manufacturers. Tables 6 – 2 through 6 – 32 are parts lists and figures 6 – 1 through 6 – 25 are component location diagrams for the Model 2765 Call Disposition Analyzer.

Table 6—1. Model 2765 List of Manufacturers.

Code No.	Manufacturer
01121	Allen Bradley, Milwaukee, Wis. 53212
01295	Texas Instruments Inc., Dallas, Texas 75222
02660	Amphenol Corp., Broadview, Ill. 60153
04713	Motorola Inc., Pheonix, Az. 85008
05397	Raco Division of Circle Seal Corp., Anaheim, Ca. 92803
09353	C & K Components Onc., Watertown, Ma. 02172
12065	Transitron Electronic Corp., Boston, Ma. 02128
13606	Sprague Electric Co., Concord, N.H. 03301
17803	Fairchild, Mountain View, Ca.
18324	Signetics Corp., Sunnyvale, Ca. 94086
19701	Electra/Midlands, Mineral Wells, Texas 76067
27735	F-DYNE Electronics, Bridgeport, Conn. 06600
49671	RCA Corp., New York, N.Y. 10020
71590	Centralab Electronics, Milwaukee, Wis. 53201
71785	Cinch Mfg., Co., Elk Grove, Ill. 60007
72136	Electro Motive Mfg., Willimantic, Conn. 06226
72982	Erie Technological Products, Eria, Pa. 16512
73138	Beckman Instruments, Fullerton, Ca. 92634
80294	Bourns Inc., Riverside, Ca. 92507
82389	Switchcraft Inc., Chicago, Ill. 60630
91506	Augat Inc., Attleboro, Ma. 02703
91662	Elco Corp., Willow Grove, Pa. 19090

Table 6—2. Model 2765 Unit, Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
A1	O/A WIR&ASSY			A276500001
A2	CASE ASSY			A276500299
A3	EXTENDER CARD E95205			A008510027
MAN1	MANUAL 2765			A276500600
MAN2	2765 SYSTEM.MANUAL			A276500601
MP1	19 RACK BRKT			A276500108
MP2	SAME AS MP1			
MP3	SILK SCREEN SN TAG			A000100068
MP4	CARD RETAINER			A276500120
MP5	SAME AS MP4			
W1	TTY CABLE			A276500021
W2	TTS 76 CABLE			A276500022
W3	2761 & 2 CABLES			A276500023
W5	2776 CABLE			A276500025
W4	TN 76 CABLE			A276500026
W6	8'18GA 3WIRE LINE	70903	17258	932000300

Table 6—3. Model 2765, Overall Assembly A1 Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
A2	ASSY 96332 CKT INPUT BUF			A276500032
A3	ASSY96333 24HR CLOCK			A276500033
A5	ASSY 96335 CKT ACCESS DET			A276500035
A7	ASSY 96337 ORIG SUPV DET			A276500037
A8	ASSY 96338 2762 INTERFACE			A276500038
A9	ASSY 96339 DIAL NO ORGAN			A276500039
A10	ASSY 96340 TTS-76 INTER			A276500040
A11	ASSY 96341 TST RESULT DET			A276500041
A12	ASSY96329 OUTPUT BUFF			A276500029
A13	ASSY 96343 SPEC FUNCT GEN			A276500043
A14	ASSY 96344 TONES FILTER			A276500044
A15	ASSY 96345 ADDRESS CONT			A276500045
A16	ASSY 96506 TONES & RB DET			A276500047
A17	ASSY 96330 DATA CONTROL			A276500030
A18	ASSY 96342 TONES DET			A276500042
A19	ASSY 96331 CALL INH CONT			A276500031
A20	ASSY 96346 DIGITAL TIMER			A276500046
A22	SAME AS A20			
A23	ASSY 96510 PRINT CONTROL			A276500048
A25	ASSY 96505 DISP. TIMERS			A276500049
A30	ASSY INTERCONNECTION BD			A276500036
A31	FRONT PANEL WIRING&ASSY			A276500028
A32	ASSY 01 INH MODULE			A276500019
A33	REAR PANEL WIRING&ASSY			A276500027
B1	42CFM 50/60HZ	AMPHENOL	760-99-XU-11115	920001200
MP1	FILTR,AL,5-3/4 SQ.X3/32	RPC	A217039	920100400
W1	3M CABLE			A276500020

SECTION 6

ELECTRONIC PARTS LIST

6.1 **INTRODUCTION.**

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05397	Raco Division of Circle Seal Corp., Anaheim, Ca. 92803
09353	C & K Components Onc., Watertown, Ma. 02172
12065	Transitron Electronic Corp., Boston, Ma. 02128
13606	Sprague Electric Co., Concord, N.H. 03301
17803	Fairchild, Mountain View, Ca.
18324	Signetics Corp., Sunnyvale, Ca. 94086
19701	Electra/Midlands, Mineral Wells, Texas 76067
27735	F-DYNE Electronics, Bridgeport, Conn. 06600
49671	RCA Corp., New York, N.Y. 10020
71590	Centralab Electronics, Milwaukee, Wis. 53201
71785	Cinch Mfg., Co., Elk Grove, Ill. 60007
72136	Electro Motive Mfg., Willimantic, Conn. 06226
72982	Erie Technological Products, Eria, Pa. 16512
73138	Beckman Instruments, Fullerton, Ca. 92634
80294	Bourns Inc., Riverside, Ca. 92507
82389	Switchcraft Inc., Chicago, Ill. 60630
91506	Augat Inc., Attleboro, Ma. 02703
91662	Elco Corp., Willow Grove, Pa. 19090

Table 6—2. Model 2765 Unit. Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
A1	D/A WIR&ASSY			A276500001
A2	CASE ASSY			A276500299
A3	EXTENDER CARD E95205			A008510027
MAN1	MANUAL 2765			A276500600
MAN2	2765 SYSTEM.MANUAL			A276500601
MP1	19 RACK BRKT			A276500103
MP2	SAME AS MP1			
MP3	SILK SCREEN SN TAG			A000100068
MP4	CARD RETAINER			A276500120
MP5	SAME AS MP4			
W1	TTY CABLE			A276500021
W2	TTS 76 CABLE			A276500022
W3	2761 & 2 CABLES			A276500023
W5	2776 CABLE			A276500025
W4	TN 76 CABLE			A276500026
W6	8'18GA 3WIRE LINE	70903	1725d	932000300

Table 6—3. Model 2765, Overall Assembly A1 Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
A2	ASSY 96332 CKT INPUT BUF			A276500032
A3	ASSY96333 24HR CLOCK			A276500033
A5	ASSY 96335 CKT ACCESS DET			A276500035
A7	ASSY 96337 ORIG SUPV DET			A276500037
A8	ASSY 96338 2762 INTERFACE			A276500038
A9	ASSY 96339 DIAL NO ORGAN			A276500039
A10	ASSY 96340 TTS-76 INTER			A276500040
A11	ASSY 96341 TST RESULT DET			A276500041
A12	ASSY96329 OUTPUT BUFF			A276500029
A13	ASSY 96343 SPEC FUNCT GEN			A276500043
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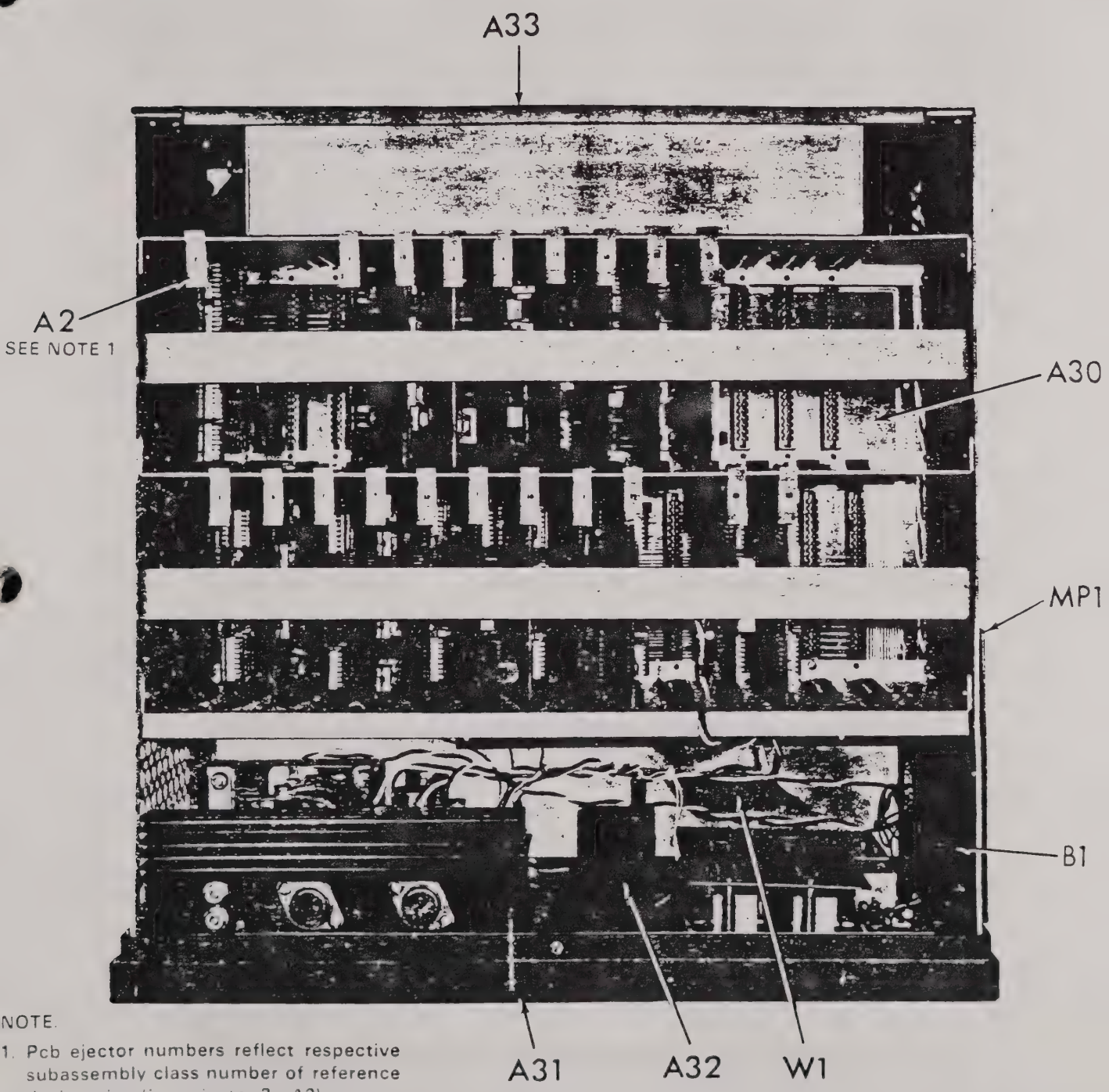
A15	ASSY 96345 ADDRESS CONT			A276500045
A16	ASSY 96506 TONES & RB DET			A276500047
A17	ASSY 96330 DATA CONTROL			A276500030
A18	ASSY 96342 TONES DET			A276500042
A19	ASSY 96331 CALL INH CONT			A276500031
A20	ASSY 96346 DIGITAL TIMER			A276500046
A22	SAME AS A20			
A23	ASSY 96510 PRINT CONTROL			A276500048
A25	ASSY 96505 DISP. TIMERS			A276500049
A30	ASSY INTERCONNECTION BD			A276500036
A31	FRONT PANEL WIRING&ASSY			A276500028
A32	ASSY 01 INH MODULE			A276500019
A33	REAR PANEL WIRING&ASSY			A276500027
B1	42CFM 50/60HZ	AMPHENOL	760-99-XU-11115	920001200
MP1	FILTR,AL,5-3/4 SQ.X3/32	RPC	A217039	920100400
W1	3M CABLE			A276500020



NOTE.

1. Pcb ejector numbers reflect respective subassembly class number of reference designation (i.e., ejector 2 = A2).

For complete reference designation prefix with A1

Figure 6—1. Model 2765, Overall Assembly A1, Component Location.

Table 6—4. Model 2765, TTY Interconnection Cable W1, Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
P1	20-PIN	91662	8016-020-000-704	653202300
P2	25-PIN PLUG	71785	DB-19604-432	652000500

Table 6—5. Model 2765, TTS 76 Interconnection Cable W2, Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
P1	38PIN	91662	8016-038-000-704	653201700
P2	56PIN	91662	8016-056-000-704	653202100

Table 6—6. Model 2765, TTS 2761 and TTS 2762 Interconnection Cable W3, Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
P1	38PIN	91662	8016-038-000-704	653201700
P2	33PIN	ELCO	00-8026-033-000-725	653203600

Table 6—7. Model 2765, Model 2776 and TN 76 Interconnection Cable W4, Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
P1	38PIN	91662	8016-038-000-704	653201700
P2	50-POS	AMP	1-552015-1	654001500

Table 6—8. Model 2765, Model 2776 Interconnection Cable, W5, Parts List.

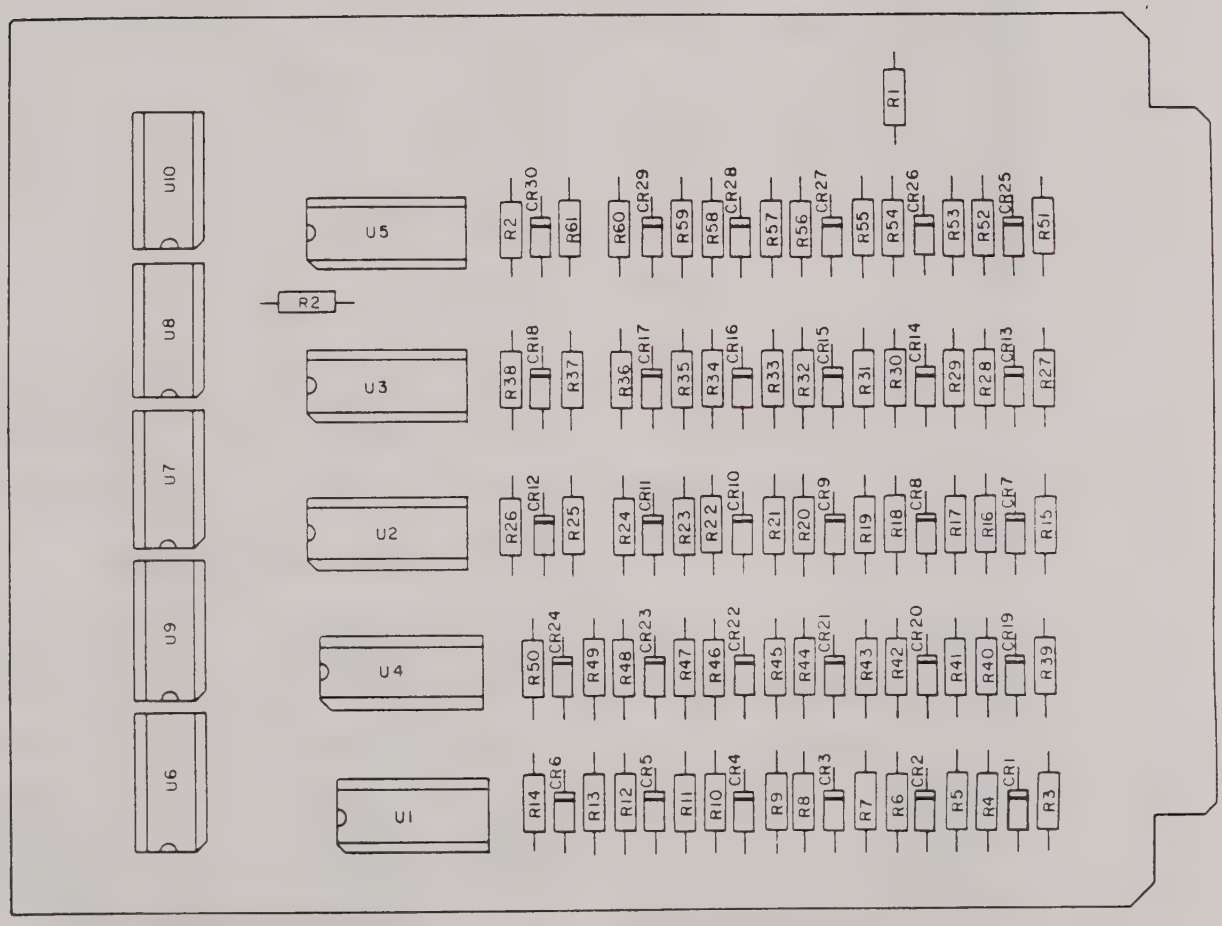
REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
W1	CLAMP CABLE 2 IN	HOLUB	[illegible]	[illegible]
P1	RECEPT FLAT CABLE 60 P N 12	AMP	3-552037-1	[illegible]

Table 6—9. Model 2765, Circuit Input Buffer Assy A1A2,A3 and A4 (96332) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
CR1	D035 500MW 20V	12065	1N4148	560041450
CR2	SAME AS CR1			
CR3	SAME AS CR1			
CR4	SAME AS CR1			
CR5	SAME AS CR1			
CR6	SAME AS CR1			
CR7	SAME AS CR1			
CR8	SAME AS CR1			
CR9	SAME AS CR1			
CR10	SAME AS CR1			
CR11	SAME AS CR1			
CR12	SAME AS CR1			
CR13	SAME AS CR1			
CR14	SAME AS CR1			
CR15	SAME AS CR1			
CR16	SAME AS CR1			
CR17	SAME AS CR1			
CR18	SAME AS CR1			
CR19	SAME AS CR1			
CR20	SAME AS CR1			
CR21	SAME AS CR1			
CR22	SAME AS CR1			
CR23	SAME AS CR1			
CR24	SAME AS CR1			
CR25	SAME AS CR1			
CR26	SAME AS CR1			
CR27	SAME AS CR1			
CR28	SAME AS CR1			
CR29	SAME AS CR1			
CR30	SAME AS CR1			
CR31	A140 1W 5% 10V	SCHAUER	SZ10.0A	562001002
R1	1.5K 1/2W 10%	01121	TYPE EB	200201526
R2	22K 1/4W 10%	01121	TYPE CB	200102236
R3	SAME AS R2			
R4	SAME AS R2			
R5	SAME AS R2			
R6	SAME AS R2			
R7	SAME AS R2			
R8	SAME AS R2			
R9	SAME AS R2			
R10	SAME AS R2			
R11	SAME AS R2			
R12	SAME AS R2			
R13	SAME AS R2			
R14	SAME AS R2			
R15	SAME AS R2			
R16	SAME AS R2			
R17	SAME AS R2			
R18	SAME AS R2			
R19	SAME AS R2			
R20	SAME AS R2			
R21	SAME AS R2			

Table 6—9 (cont'd)

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R22	SAME AS R2			
R23	SAME AS R2			
R24	SAME AS R2			
R25	SAME AS R2			
R26	SAME AS R2			
R27	SAME AS R2			
R28	SAME AS R2			
R29	SAME AS R2			
R30	SAME AS R2			
R31	SAME AS R2			
R32	SAME AS R2			
R33	SAME AS R2			
R34	SAME AS R2			
R35	SAME AS R2			
R36	SAME AS R2			
R37	SAME AS R2			
R38	SAME AS R2			
R39	SAME AS R2			
R40	SAME AS R2			
R41	SAME AS R2			
R42	SAME AS R2			
R43	SAME AS R2			
R44	SAME AS R2			
R45	SAME AS R2			
R46	SAME AS R2			
R47	SAME AS R2			
R48	SAME AS R2			
R49	SAME AS R2			
R50	SAME AS R2			
R51	SAME AS R2			
R52	SAME AS R2			
R53	SAME AS R2			
R54	SAME AS R2			
R55	SAME AS R2			
R56	SAME AS R2			
R57	SAME AS R2			
R58	SAME AS R2			
R59	SAME AS R2			
R60	SAME AS R2			
R61	SAME AS R2			
U1	16DILP	RCA	CA3081	500030810
U2	SAME AS U1			
U3	SAME AS U1			
U4	SAME AS U1			
U5	SAME AS U1			
U6	DIODE MATRIX PROGRAM			A276500054
U7	DIODE MATRIX PROGRAM			A276500055
U8	DIODE MATRIX PROGRAM			A276500056
U9	DIODE MATRIX PROGRAM			A276500057
U10	DIODE MATRIX PROGRAM			A276500058
XU6	14PDIL	91506	563527 1	820100300
XU7	SAME AS XU6			
XU8	SAME AS XU6			
XU9	SAME AS XU6			
XU10	SAME AS XU6			

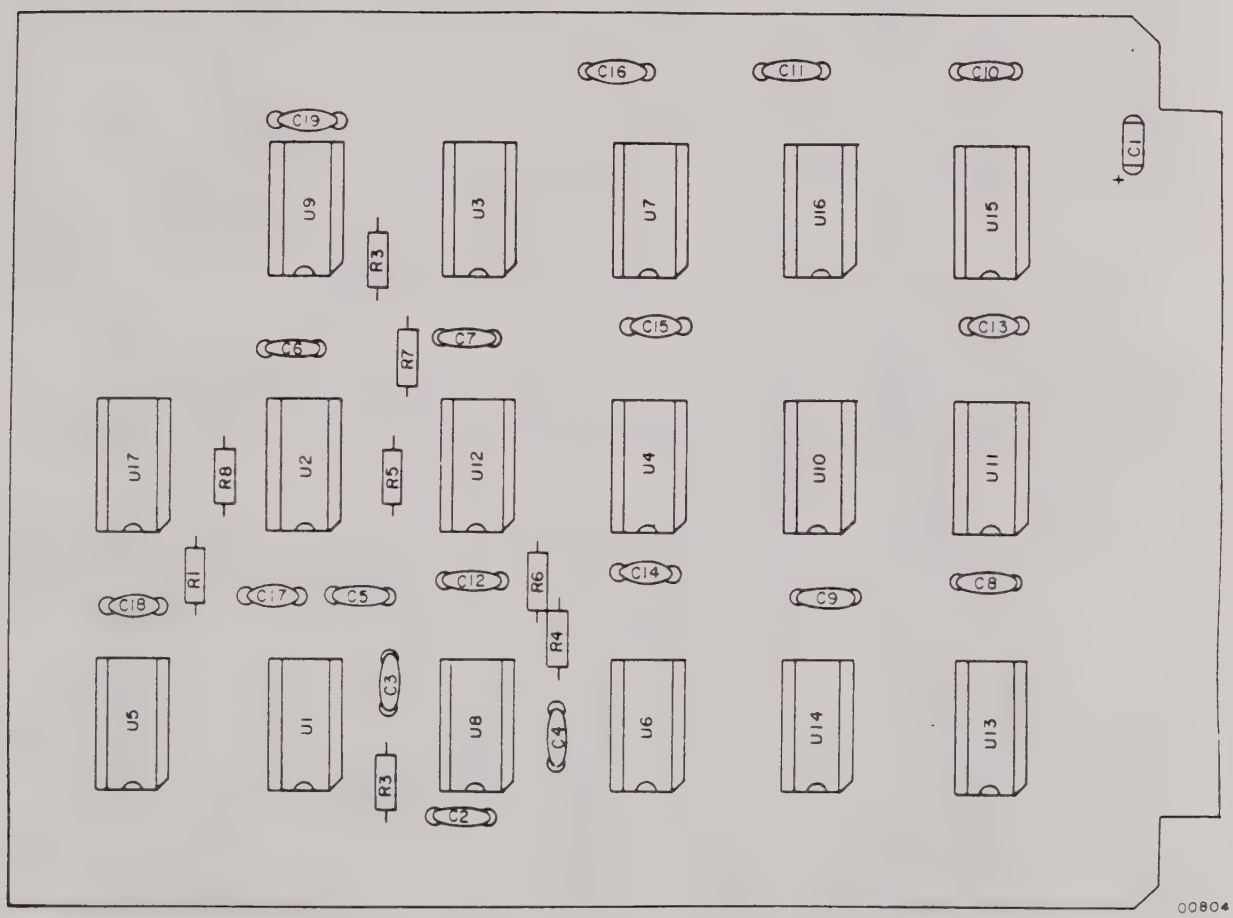


NOTE:
PREFIX REFERENCE DESIGNATIONS WITH A1A2, A1A4 OR A1A6 AS APPROPRIATE.

Figure 6–2. Model 2765, Circuit Input Buffer, A1,A2,4&6, (96332), Component Location.

Table 6—10. Model 2765, 24 Hour Clock Assy A1A3 (96333) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF	10%	6V	05397	T330A226K006AS	310002260
C2	.01UF	20%	16V	71590	UK16-103	330701031
C3	SAME AS C2					
C4	SAME AS C2					
C5	SAME AS C2					
C6	SAME AS C2					
C7	SAME AS C2					
C8	SAME AS C2					
C9	SAME AS C2					
C10	SAME AS C2					
C11	SAME AS C2					
C12	SAME AS C2					
C13	SAME AS C2					
C14	SAME AS C2					
C15	SAME AS C2					
C16	SAME AS C2					
C17	SAME AS C2					
C18	SAME AS C2					
C19	SAME AS C2					
R1	1K	1/4W 10%		01121	TYPE CB	200101026
R2	2.2K	1/4W 10%		01121	TYPE CB	200102226
R3	10K	1/4W 10%		01121	TYPE CB	200101036
R4	SAME AS R3					
R5	22-	1/4W 10%		01121	TYPE CB	200102206
R6	SAME AS R5					
R7	SAME AS R5					
R8	SAME AS R5					
U1	16DILP			T.I.	SN7485N	510074850
U2	14DILP		500V	01295	SN7402N	510074020
U3	14DILP			01295	SN7405N	510074050
U4	QUAD 2-IN NAND SCHMIT TR			TI	SN74132	510074132
U5	SAME AS U1					
U6	16DILP SCHOTKY			TI	SN74S257N	510074257
U7	SAME AS U6					
U8	16DILP			TI	SN74123N	510074123
U9	14DILP			01295	SN7474N	510074740
U10	14DILP			01295	SN7492N	510074920
U11	14DILP			01295	SN7490N	510074900
U12	SAME AS U2					
U13	50-MHZ PRESET DECADE CTR			T.I.	SN74196N	510074196
U14	SAME AS U13					
U15	SAME AS U13					
U16	SAME AS U13					
U17	14DILP			01295	SN7473N	510074730



NOTE:
PREFIX REFERENCE DESIGNATIONS WITH A1A3.

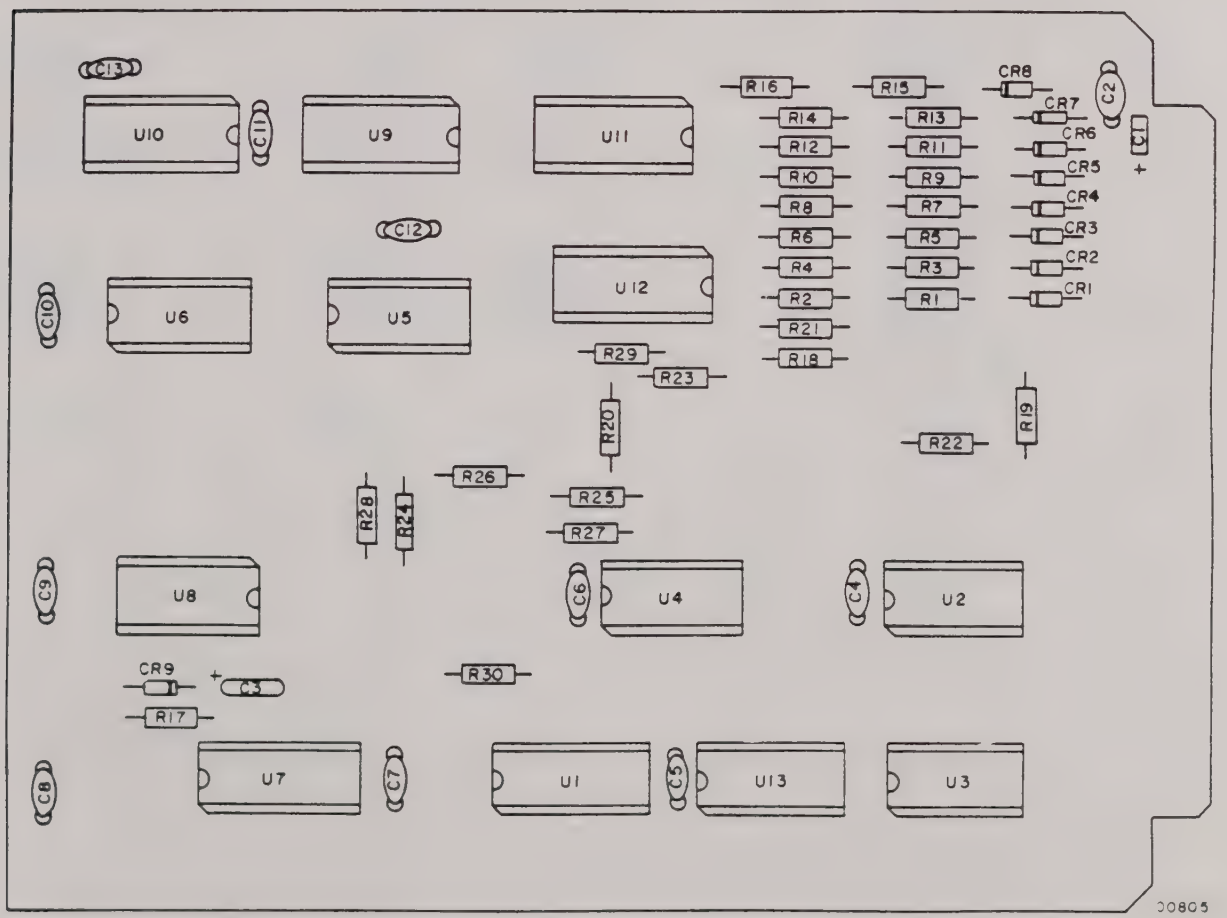
Figure 6–3. Model 2765, 24 Hour Clock, A1A3 (96333), Component Location.

Table 6—11. Model 2765, Circuit Access Detector Assy A1A5 (96335) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF	10%	6V	05397	T330A226K006AS	310002260
C2	.01UF	20%	16V	71590	UK16-103	330701031
C3	SAME AS C1					
C4	SAME AS C2					
C5	SAME AS C2					
C6	SAME AS C2					
C7	SAME AS C2					
C8	SAME AS C2					
C9	SAME AS C2					
C10	SAME AS C2					
C11	SAME AS C2					
C12	SAME AS C2					
C13	SAME AS C2					
CR1	DO35	500MW	20V	12065	1N4148	560041480
CR2	SAME AS CR1					
CR3	SAME AS CR1					
CR4	SAME AS CR1					
CR5	SAME AS CR1					
CR6	SAME AS CR1					
CR7	SAME AS CR1					
CR8	SAME AS CR1					
CR9	SAME AS CR1					
R1	10K	1/4W	10%	01121	TYPE CB	200101036
R2	SAME AS R1					
R3	SAME AS R1					
R4	SAME AS R1					
R5	SAME AS R1					
R6	SAME AS R1					
R7	SAME AS R1					
R8	SAME AS R1					
R9	SAME AS R1					
R10	SAME AS R1					
R11	SAME AS R1					
R12	SAME AS R1					
R13	SAME AS R1					
R14	SAME AS R1					
R15	SAME AS R1					
R16	SAME AS R1					
R17	22K	1/4W	10%	01121	TYPE CB	200102236
R18	SAME AS R1					
R19	2.2K	1/4W	10%	01121	TYPE CB	200102226
R20	SAME AS R1					
R21	SAME AS R1					
R22	SAME AS R19					
R23	SAME AS R19					
R24	SAME AS R19					
R25	SAME AS R19					
R26	SAME AS R1					
R27	SAME AS R1					
R28	SAME AS R19					
R29	SAME AS R1					

Table 6—11 (cont'd)

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R30	SAME AS R19			
U1	16DILP	T.I.	SN7485N	510074850
U2	14DILP	01295	SN7410N	510074100
U3	14PDIL	TI	SN7403N	510074030
U4	DILP	01295	SN7404N14P	510074040
U5	SAME AS U4			
U6	14DILP	01295	SN7430N	510074300
U7	16DILP	TI	SN74123N	510074123
U8	14DILP	01295	SN7473N	510074730
U9	16DILP	01295	SN7475N	510074750
U10	SAME AS U9			
U11	16DILP	RCA	CA3081	500030810
U12	SAME AS U11			
U13	SAME AS U3			

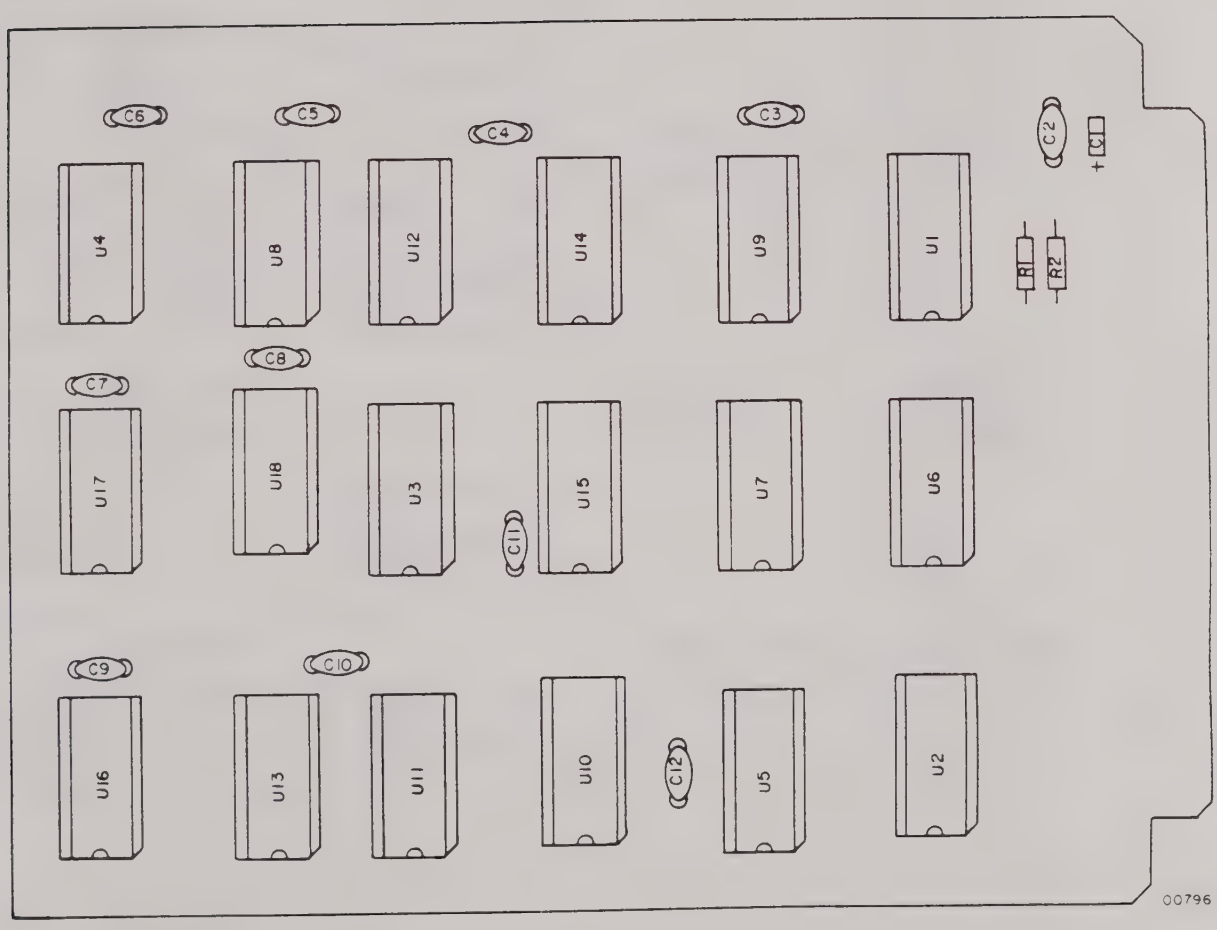


NOTE:
PREFIX REFERENCE DESIGNATIONS WITH A1A5.

Figure 6—4. Model 2765, Circuit Access Detector, A1A5 (96335), Component Location.

Table 6—12. Model 2765, Originating Supervision Detector Assy A1A7 (96337), Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF	10%	6V	05397	T330A226K006AS	310002260
C2	.01UF	20%	16V	71590	UK16-103	330701031
C3	SAME AS C2					
C4	SAME AS C2					
C5	SAME AS C2					
C6	SAME AS C2					
C7	SAME AS C2					
C8	SAME AS C2					
C9	SAME AS C2					
C10	SAME AS C2					
C11	SAME AS C2					
C12	SAME AS C2					
R1	2.2K	1/4W	10%	01121	TYPE CB	200102226
R2	SAME AS R1					
U1	14DILP			BECKMAN	899-1-R2K	514500100
U2	16DILP			T.I.	SN7485N	510074850
U3	14PDIL			TI	SN7422N	510007422
U4	14DILP			01295	SN7420N	510074200
U5	14DILP			01295	SN7473N	510074730
U6	14DILP			01295	SN7405N	510074050
U7	14PDIL			TI	SN7403N	510074030
U8	SAME AS U4					
U9	14DILP			TI	SN7414N	510007414
U10	16DILP			01295	SN7475N	510074750
U11	14DILP			TI	SN7412N	510007412
U12	14DILP			01295	SN7410N	510074100
U13	SAME AS U4					
U14	SAME AS U12					
U15	SAME AS U12					
U16	14DILP			01295	SN7493N	510074930
U17	SAME AS U16					
U18	SAME AS U5					

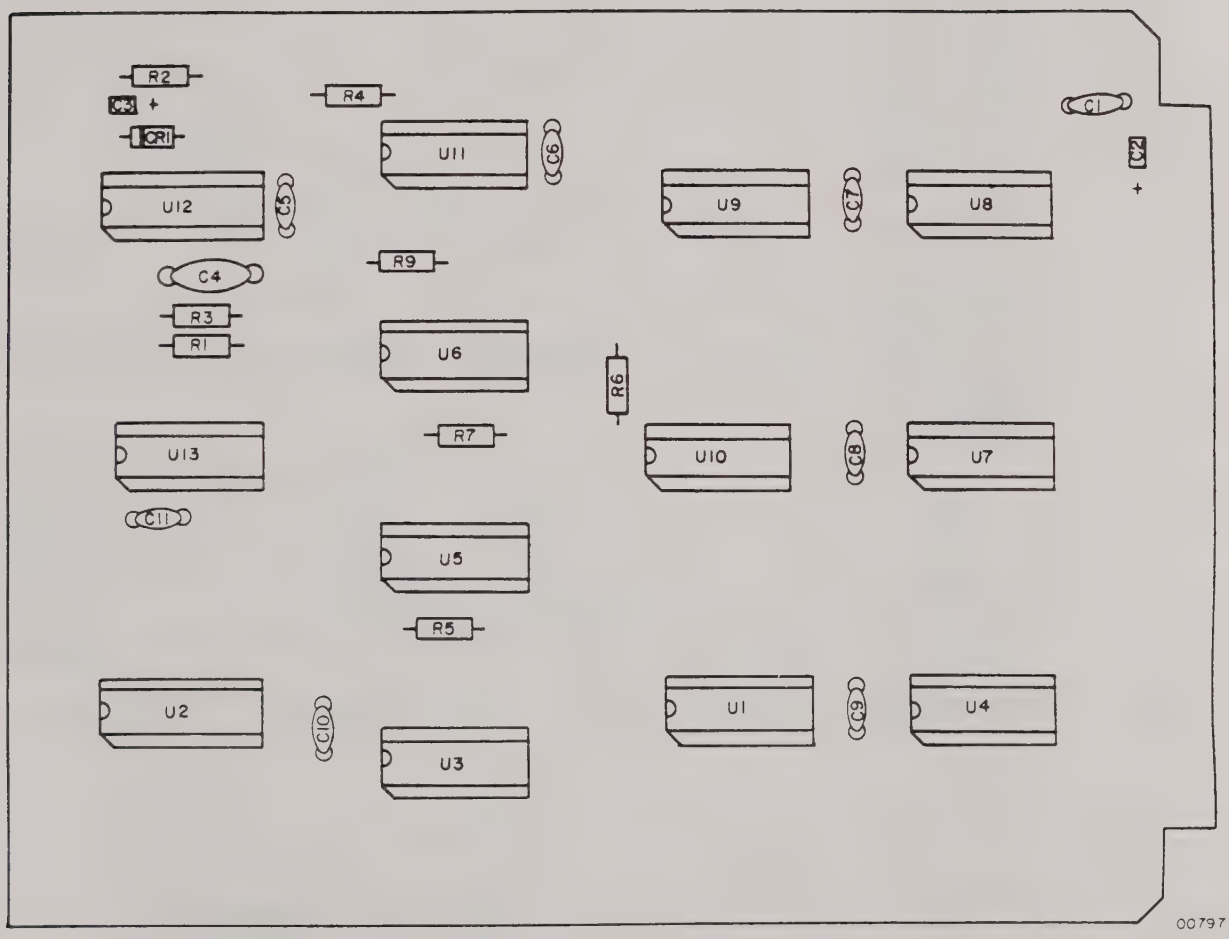


NOTE:
PREFIX REFERENCE DESIGNATIONS WITH A1A7.

Figure 6–5. Model 2765. Originating Supervision Detector, A1A7 (96337), Component Location.

Table 6—13. Model 2765, TTS 2762 Interface Assy A1A8 (96338) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF 10% 6V	05397	T330A226K006AS	310002260
C2	.01UF 20% 16V	71590	UK16-103	330701031
C3	1UF 10% 35V	05397	T330A105K035AS	310001051
C4	.005UF 10% 100V	13606	225P50291WD3	320005020
C5	SAME AS C2			
C6	SAME AS C2			
C7	SAME AS C2			
C8	SAME AS C2			
C9	SAME AS C2			
C10	SAME AS C2			
C11	SAME AS C2			
CR1	DO35 500MW 20V	12065	1N4148	560041480
R1	2.2K 1/4W 10%	01121	TYPE CB	200102226
R2	10K 1/4W 10%	01121	TYPE CB	200101036
R3	SAME AS R1			
R4	1K 1/4W 10%	01121	TYPE CB	200101026
R5	SAME AS R1			
R6	SAME AS R4			
R7	SAME AS R4			
R8	SAME AS R4			
U1	14DILP	TI	SN7414N	510007414
U2	16 DILP	TI	SN74174N	510074174
U3	14DILP	01295	SN7405N	510074050
U4	14PDIL	TI	SN7403N	510074030
U5	SAME AS U4			
U6	14DILP	TI	SN7412N	510007412
U7	SAME AS U4			
U8	SAME AS U4			
U9	DILP	01295	SN7404N14P	510074040
U10	DIL	01295	SN7413N14P	510074130
U11	QUAD 2-IN NAND SCHMIT TR	TI	SN74132	510074132
U12	14DILP	TI	SN74123N	510074123
U13	LP SCHOT	TI	SN74LS73N	510907473

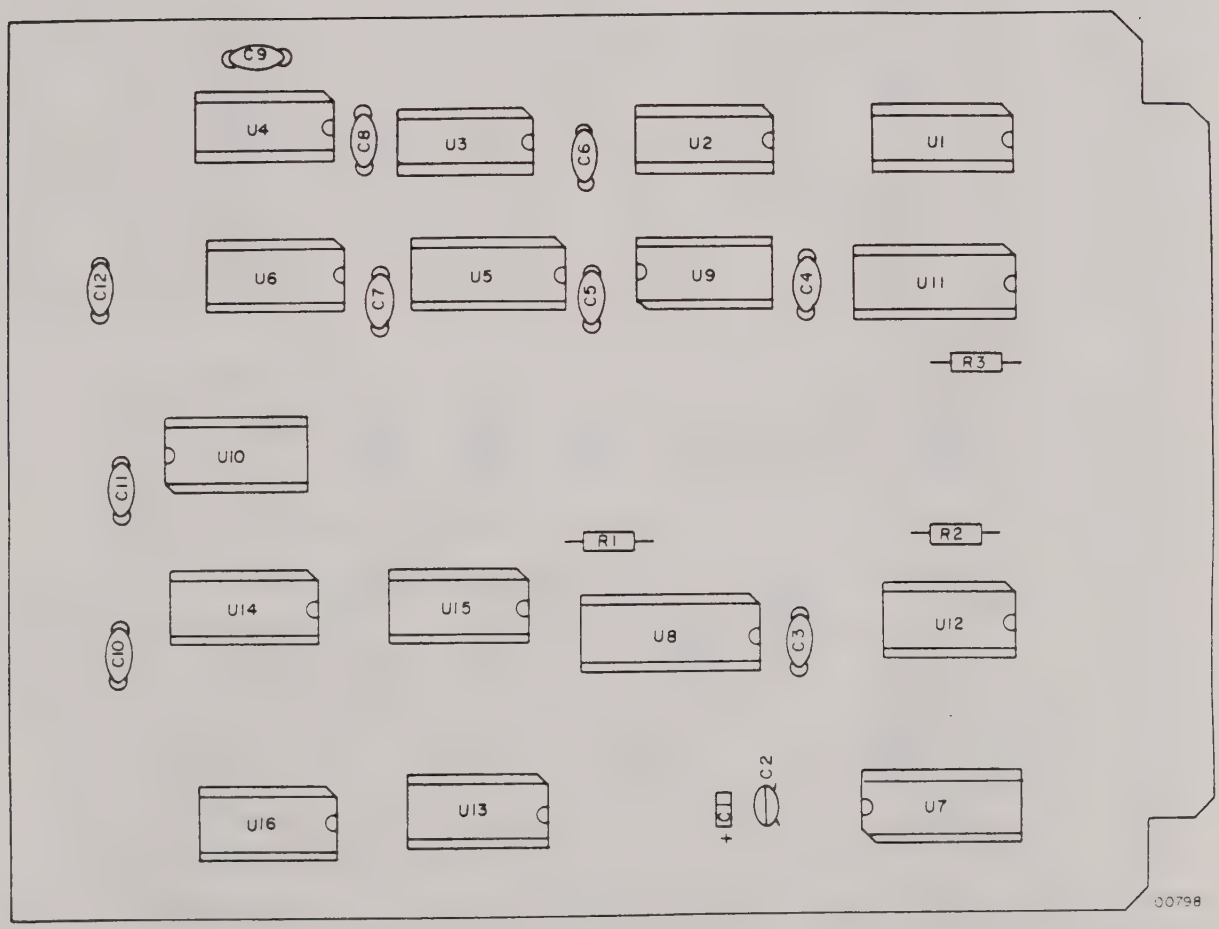


NOTE:
PREFIX REFERENCE DESIGNATIONS WITH A1A8.

Figure 6—6.Model 2765, TTS 2762 Interface, A1A8 (96338), Component Location.

Table 6—14. Model 2765, Dialed Number Organizer Assy A1A9 (96339) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF 10% 6V	05397	T330A226K006AS	310002260
C2	.01UF 20% 16V	71590	UK16-103	330701031
C3	SAME AS C2			
C4	SAME AS C2			
C5	SAME AS C2			
C6	SAME AS C2			
C7	SAME AS C2			
C8	SAME AS C2			
C9	SAME AS C2			
C10	SAME AS C2			
C11	SAME AS C2			
C12	SAME AS C2			
R1	2.2K 1/4W 10%	01121	TYPE CB	200102226
R2	SAME AS R1			
R3	SAME AS R1			
U1	14DILP	BECKMAN	899-1-R2K	514500100
U2	14DILP	01295	SN7473N	510074730
U3	SAME AS U2			
U4	SAME AS U2			
U5	16DILP	TI	SN74147N	510074147
U6	DILP	01295	SN7404N14P	510074040
U7	16DILP	T.I.	SN7485N	510074850
U8	14DILP	01295	SN7405N	510074050
U9	14DILP	01295	SN7493N	510074930
U10	14DILP	01295	SN7420N	510074200
U11	16DILP	01295	SN7475N	510074750
U12	QUAD 2-IN NAND SCHMIT TR	TI	SN74132	510074132
U13	14PDIL	TI	SN7403N	510074030
U14	SAME AS U13			
U15	14DILP	TI	SN7412N	510007412
U16	SAME AS U15			



NOTE:
PREFIX REFERENCE DESIGNATIONS
WITH A1A9

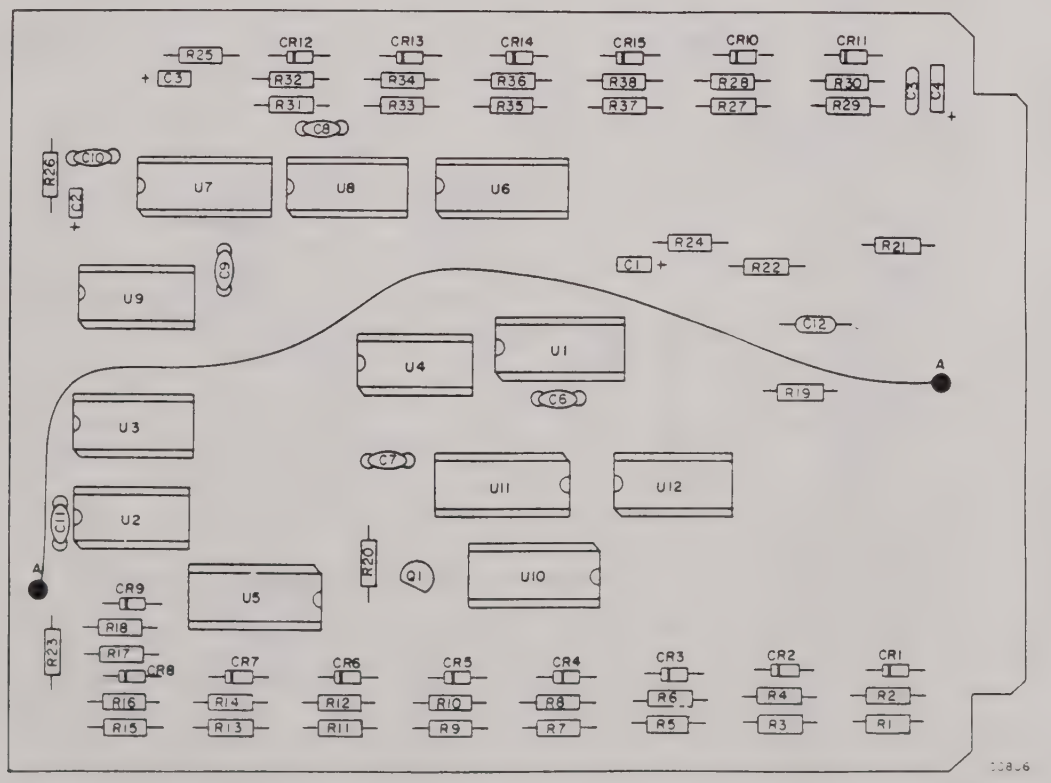
Figure 6–7. Model 2765, Dialed Number Organizer, A1A9 (96339), Component Location.

Table 6—15. Model 2765, TTS 76 Interface Assy A1A10 (96340) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	1UF		10% 35V	05397	T330A105K035AS	310001051
C2	SAME AS C1					
C3	SAME AS C1					
C4	22UF		10% 6V	05397	T330A226K006AS	310002260
C5	.01UF		20% 16V	71590	CK16-103	330701031
C6	SAME AS C5					
C7	SAME AS C5					
C8	SAME AS C5					
C9	SAME AS C5					
C10	SAME AS C5					
C11	SAME AS C5					
C12	.005UF		10% 100V	13606	225P50291WD3	320005020
CR1	DO35	500MW	75V	12065	1N4148	560041480
CR2	SAME AS CR1					
CR3	SAME AS CR1					
CR4	SAME AS CR1					
CR5	SAME AS CR1					
CR6	SAME AS CR1					
CR7	SAME AS CR1					
CR8	SAME AS CR1					
CR9	SAME AS CR1					
CR10	SAME AS CR1					
CR11	SAME AS CR1					
CR12	SAME AS CR1					
CR13	SAME AS CR1					
CR14	SAME AS CR1					
CR15	SAME AS CR1					
Q1	TO92AFA	310MW	400V	17803	2N3569	550035690
R1	6.8K	1/4W 10%		01121	TYPE CB	200106826
R2	22K	1/4W 10%		01121	TYPE CB	200102236
R3	SAME AS R1					
R4	SAME AS R2					
R5	SAME AS R1					
R6	SAME AS R2					
R7	SAME AS R1					
R8	SAME AS R2					
R9	SAME AS R1					
R10	SAME AS R2					
R11	SAME AS R1					
R12	SAME AS R2					
R13	SAME AS R1					
R14	SAME AS R2					
R15	SAME AS R1					
R16	SAME AS R2					
R17	SAME AS R1					
R18	SAME AS R2					
R19	SAME AS R2					
R20	12K	1/4W 10%		01121	TYPE CB	200101236
R21	1K	1/4W 10%		01121	TYPE CB	200101036
R22	SAME AS R2					
R23	2.2K	1/4W 10%		01121	TYPE CB	200102226
R24	10K	1/4W 10%		01121	TYPE CB	200101036
R25	SAME AS R2					
R26	SAME AS R2					
R27	SAME AS R1					

Table 6—15 (cont'd)

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R28	SAME AS R2			
R29	SAME AS R1			
R30	SAME AS R2			
R31	SAME AS R1			
R33	SAME AS R1			
R35	SAME AS R1			
R37	SAME AS R1			
U1	16DILP	TI	SN74123N	510074123
U2	14DILP	01295	SN7473N	510074730
U3	14PDIL	TI	SN7403N	510074030
U4	SAME AS U3			
U5	16DILP	RCA	CA3081	500030810
U6	SAME AS U5			
U7	SAME AS U1			
U8	DILP	01295	SN7404N14P	510074040
U9	SAME AS U2			
U10	SAME AS U5			
U11	16DILP	TI	SN74147N	5100741+7
U12	SAME AS U3			



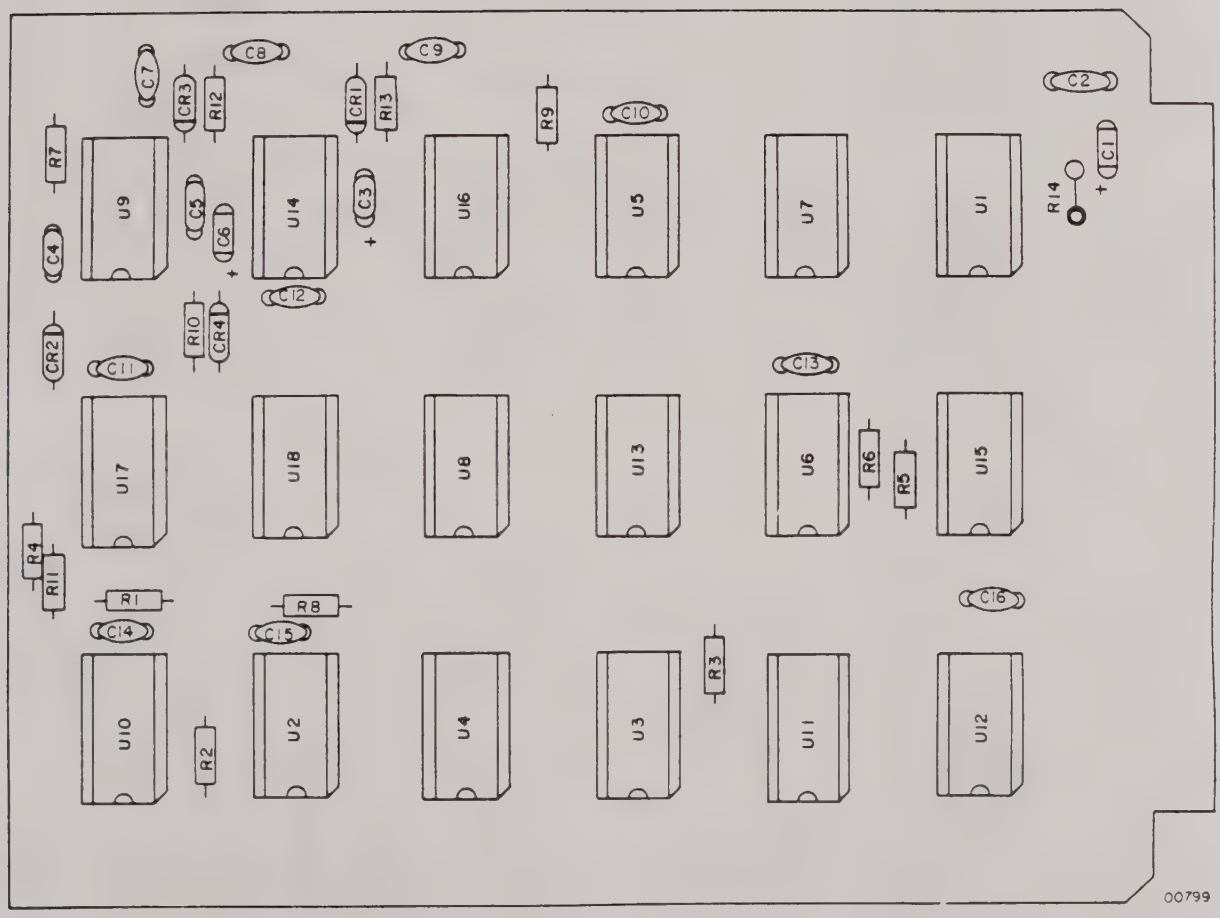
NOTE

PREFIX REFERENCE DESIGNATIONS WITH A1A10.

Figure 6—8. Model 2765, TTS 76 Interface, A1A10 (96340), Component Location.

Table 6—16. Model 2765, Test Results Assy A1A11 (96341) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION				MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF		10%	6V	05397	T330A226K006AS	310002260
C2	.01UF		20%	16V	71590	UK16-103	330701031
C3	82UF		10%	10V	13606	196D826X9010PE4	310808260
C4	SAME AS C2						
C5	SAME AS C3						
C6	10UF		10%	10V	05397	T330A106K010AS	310001060
CR1	DO35	500MW		20V	12065	1N4148	560041480
CR2	SAME AS CR1						
CR3	SAME AS CR1						
R1	1K	1/4W	10%		01121	TYPE CB	200101026
R2	2.2K	1/4W	10%		01121	TYPE CB	200102226
R3	SAME AS R2						
R4	SAME AS R2						
R5	SAME AS R2						
R6	SAME AS R2						
R7	SAME AS R2						
R8	SAME AS R2						
R9	SAME AS R2						
R10	10K	1/4W	10%		01121	TYPE CB	200101036
R11	39K	1/4W	10%		01121	TYPE CB	200103936
R12	SAME AS R11						
R13	SAME AS R11						
R14	SAME AS R1						
U1	DILP				01295	SN7404N14P	510074040
U2	DILP				01295	SN7406N14P	510074080
U3	16DILP				01295	SN7475N	510074750
U4	16DILP				TI	SN74147N	510074147
U5	14DILP				01295	SN7420N	510074200
U6	14DILP				01295	SN7405N	510074050
U7	14DILP				TI	SN7412N	510007412
U8	SAME AS U2						
U9	16DILP				TI	SN74123N	510074123
U10	16DILP				T.I.	SN7485N	510074850
U11	14PDIL				TI	SN7403N	510074030
U12	SAME AS U11						
U13	14DILP				01295	SN7474N	510074740
U14	SAME AS U9						
U15	SAME AS U11						
U16	14DILP				01295	SN7473N	510074730
U17	SAME AS U16						
U18	14DILP				01295	SN7430N	510074300

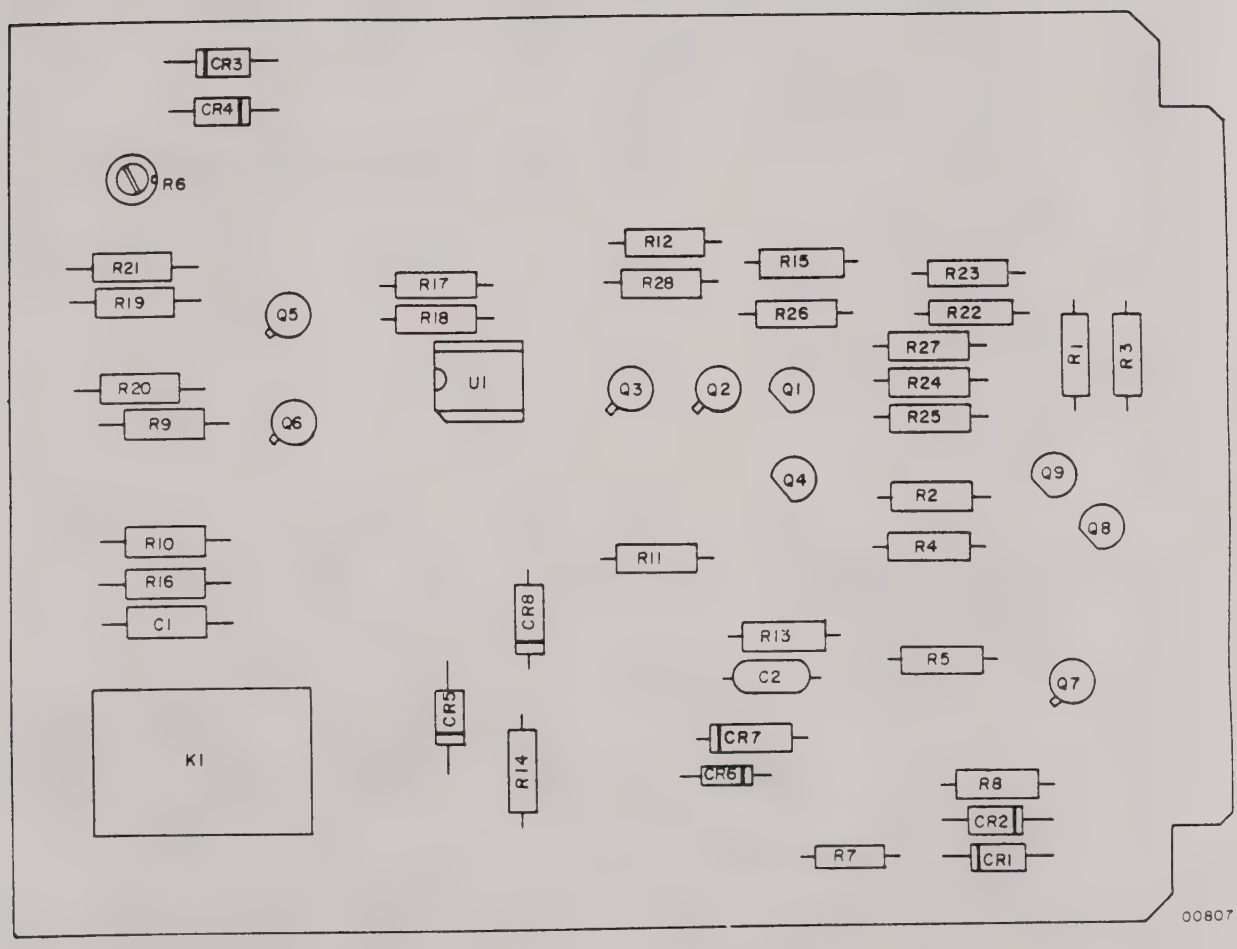


NOTE:
PREFIX REFERENCE DESIGNATIONS WITH A1A11.

Figure 6–9. Model 2765, Test Results Detector, A1A11 (96341), Component Location.

Table 6—17. Model 2765, Output Buffer Assy A1A12 (96379) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	100PF	S3NTC 10%	1KV	71590	DD-101	330001010
C2	.1UF	10%	100V	13606	225P10491WD3	320001040
CR1	DO-41		200V	12065	1N4003	560040030
CR2	SAME AS CR1					
CR3	SAME AS CR1					
CR4	SAME AS CR1					
CR5	SAME AS CR1					
CR6	SAME AS CR1					
CR7	CASE 17	5W 10%	20V	MOTOROLA	1N5357A	562053571
CR8	SAME AS CR1					
K1		1A	12V	SIEMENS	V23012-A0102-B001	604800500
Q1	TO92AFA	310MW	400V	17803	2N3569	550035690
Q2	TO5MSS	5W	65V	49671	2N4036	552040360
Q3	SAME AS Q2					
Q4	SAME AS Q1					
Q5	TO5HNS	1W	65V	49671	2N2102	550021020
Q6	SAME AS Q2					
Q7	SAME AS Q2					
Q8	SAME AS Q1					
Q9	SAME AS Q1					
R1	10K	1/2W 10%		01121	TYPE EB	200201036
R2	SAME AS R1					
R3	SAME AS R1					
R4	SAME AS R1					
R5	2.7K	1/2W 10%		01121	TYPE EB	200202726
R6	5K	1/2W 10%	200V	HILIPOT	62P5K	232705026
R7	100-	1/2W 10%		01121	TYPE EB	200201016
R8	10-	1/2W 10%		01121	TYPE EB	200201006
R9	1K	1/2W 10%		01121	TYPE EB	200201026
R10	SAME AS R9					
R11	SAME AS R1					
R12	4.7K	1/2W 10%		01121	TYPE EB	200204726
R13	SAME AS R7					
R14	180-	1/2W 10%		01121	TYPE EB	200201816
R15	2.2K	1/2W 10%		01121	TYPE EB	200202226
R16	100K	1/2W 10%		01121	TYPE EB	200201046
R17	470-	1/2W 10%		AB	TYPE EB	200204716
R18	SAME AS R17					
R19	33-	1/2W 5%		01121	TYPE EB	200203305
R20	SAME AS R14					
R21	1.5K	1/2W 10%		01121	TYPE EB	200201526
R22	SAME AS R12					
R23	SAME AS R1					
R24	SAME AS R12					
R25	SAME AS R1					
R26	27K	1/2W 10%		01121	TYPE EB	200202736
R27	SAME AS R15					
R28	SAME AS R17					
U1	SPDIL	80MW	18O	18324	N5558V	500055580



NOTE:
PREFIX REFERENCE DESIGNATIONS WITH A1A12.

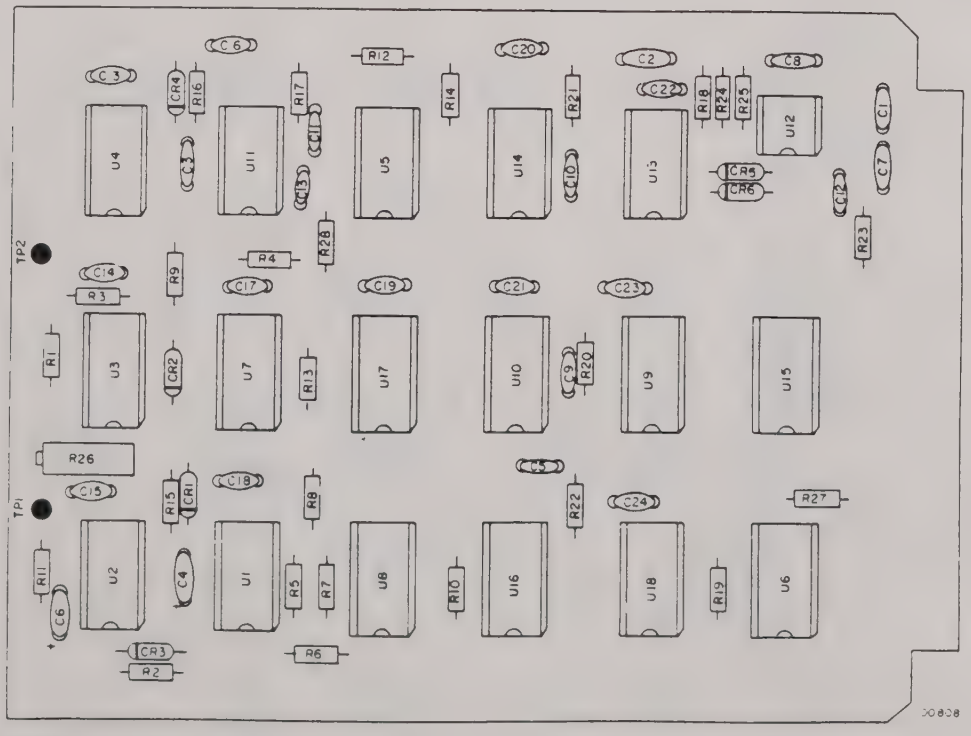
Figure 6—10. Model 2765, Output Buffer, A1A12 (96329), Component Location.

Table 6—18. Model 2765, Special Function Generator Assy A1A13 (96343) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION				MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF		10%	6V	05397	T330A226K006AS	310002260
C2	.01UF		20%	16V	71590	UK16-103	330701031
C3	68UF		20%	10V	13606	196D686X0010PE4	310806860
C4	120UF		10%	15V	SPRAGUE	196D127X9015TE4	310801270
C5	SAME AS C3						
C6	330UF		20%	6V	13606	196D337X0006TE4	310803370
C7	SAME AS C2						
C8	SAME AS C2						
C9	SAME AS C2						
C10	SAME AS C2						
C11	SAME AS C2						
C12	.1UF	Y5V TC	20%	50V	72982	8121-050-651-104M	330801040
C13	SAME AS C2						
C14	SAME AS C2						
C15	SAME AS C2						
C16	SAME AS C2						
C17	SAME AS C2						
C18	SAME AS C2						
C19	SAME AS C2						
C20	SAME AS C2						
C21	SAME AS C2						
C22	SAME AS C2						
C23	SAME AS C2						
C24	SAME AS C2						
CR1	DO35	500MW		20V	12065	1N4148	560041480
CR2	SAME AS CR1						
CR3	SAME AS CR1						
CR4	SAME AS CR1						
CR5	SAME AS CR1						
CR6	SAME AS CR1						
R1							200100026
R2	39K	1/4W	10%		01121	TYPE CB	200103936
R3	1K	1/4W	10%		01121	TYPE CB	200101026
R4	2.2K	1/4W	10%		01121	TYPE CB	200102226
R5	SAME AS R4						
R6	SAME AS R4						
R7	SAME AS R4						
R8	SAME AS R4						
R9	SAME AS R4						
R10	SAME AS R4						
R11	SAME AS R4						
R12	SAME AS R4						
R13	SAME AS R4						
R14	SAME AS R4						
R15	22K	1/4W	10%		01121	TYPE CB	200102236
R16	SAME AS R15						
R17	10K	1/4W	10%		01121	TYPE CB	200101036
R18	SAME AS R17						
R19	SAME AS R4						
R20	22-	1/4W	10%		01121	TYPE CB	200102206
R21	SAME AS R20						
R22	4.7K	1/4W	10%		01121	TYPE CB	200104726
R23	SAME AS R15						
R24	SAME AS R15						
R25	SAME AS R17						
R26	50K	.75W	10		73138	89PR50K	232505030

Table 6—18 (cont'd)

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R27	SAME AS R3			
R28	470- 1/4W 10%	01121	TYPE CB	200104716
U1	16DILP	01295	SN7445N	510074450
U2	16DILP	TI	SN74123N	510074123
U3	14DILP	01295	SN7474N	510074740
U4	14DILP	01295	SN7473N	510074730
U5	14DILP	01295	SN7406N14P	510074060
U6	14DILP	TI	SN7414N	510007414
U7	14DILP	01295	SN7405N	510074050
U8	SAME AS U7			
U9	SAME AS U7			
U10	SAME AS U4			
U11	SAME AS U2			
U12	8PDIL 80MW 180	18324	N5558V	500055580
U14	14DILP	01295	SN7490N	510074900
U13	14DILP	01295	SN7492N	510074920
U15	SAME AS U3			
U16	14DILP	TI	SN7412N	510007412
U17	IC,TRIP .3-IN POS NOR GT	01295	SN7427N	510074270
U18	DILP	01295	SN7407N14P	510074070



NOTE
PREFIX REFERENCE DESIGNATIONS WITH A1A13

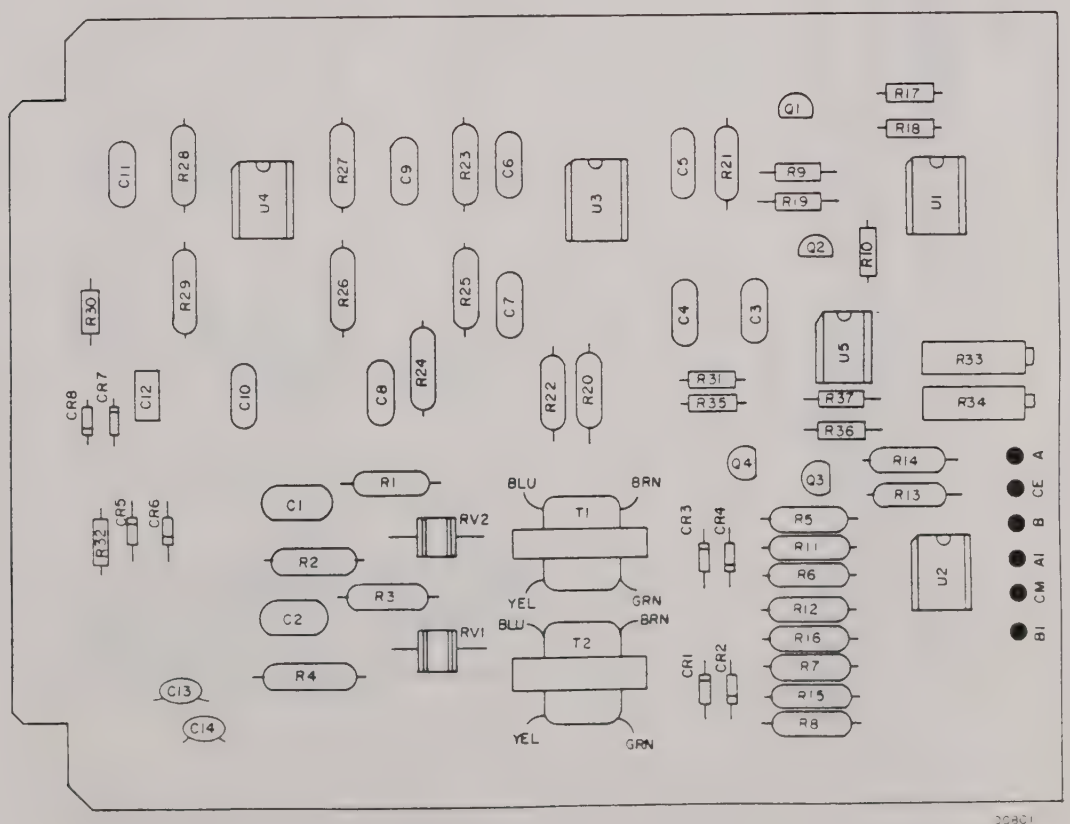
Figure 6—11. Model 2765, Special Function Generator, A1A13 (96343), Component Location.

Table 6—19. Model 2765, Tones filter Assy A1A14 (96344) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	.50UF		10% 100V	13606	225P50491YD3	320005040
C2	SAME AS C1					
C3	.05UF		5% 100V	ELMENCO	1MD-2-503J	322005030
C4	SAME AS C3					
C5	SAME AS C3					
C6	SAME AS C3					
C7	SAME AS C3					
C8	.068UF		5% 100V	ELMENCO	1MD-2-683J	322006830
C9	.18UF		5% 100V	ELMENCO	1MD-3-184J	322001840
C10	.0027UF		5% 600V	ELMENCO	6MPD-1-272J	322002720
C11	.22UF		5% 100V	72136	1MD-3-224J	322002240
C12	1000PF		1% 300V	72136	CM20D102F	335101020
C13	.01UF	Z5U TC GMV	1KV	71590	DD-103	330101030
C14	SAME AS C13					
CR1	D035	500MW	75V	12065	1N4148	560041490
CR2	SAME AS CR1					
CR3	SAME AS CR1					
CR4	SAME AS CR1					
CR5	SAME AS CR1					
CR6	SAME AS CR1					
CR7	SAME AS CR1					
CR8	SAME AS CR1					
E1			20% 90V	SIEMENS	B1-C90/20	566009020
E2	SAME AS E1					
Q1	TO92	1-5MA	250	04713	MPF103 2N5457	554001030
Q2	TO92 TO 92		400V	04713	MPF152 2N5461	555001520
Q3	SAME AS Q1					
Q4	SAME AS Q2					
R1	10K	1/8W	1%	19701	MF5C	220210021
R2	SAME AS R1					
R3	SAME AS R1					
R4	SAME AS R1					
R5	24.6K	1/8W	1%	19701	MF5C	220224621
R6	SAME AS R5					
R7	SAME AS R5					
R8	SAME AS R5					
R9	10K	1/4W	10%	01121	TYPE CB	200101036
R10	1K	1/4W	10%	01121	TYPE CB	200101026
R11	49.9K	1/8W	1%	19701	MF5C	220249921
R12	SAME AS R11					
R13	SAME AS R1					
R14	SAME AS R1					
R15	SAME AS R11					
R16	SAME AS R11					
R17	1M	1/4W	10%	01121	TYPE CB	200101056
R18	SAME AS R17					
R19	100K	1/4W	10%	01121	TYPE CB	200101046
R20	5230-	1/8W	1%	19701	MF5C	220252311
R21	2100-	1/8W	1%	19701	MF5C	220221011
R22	133K	1/8W	1%	19701	MF5C	220213311
R23	1780-	1/8W	1%	19701	MF5C	220217811
R24	374K	1/8W	1%	19701	MF5C	220237411
R25	1M.2K	1/8W	1%	19701	MF5C	22021e221
R26	SAME AS R25					
R27	SAME AS R25					

Table 6—19 (cont'd)

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R28	SAME AS R26					
R29	SAME AS R26					
R30	3.3K	1/4W	10%	01121	TYPE CB	200103326
R31	11K	1/4W	5%	01121	TYPE CB	200101165
R32	SAME AS R30					
R33	20K	.75W	10	73138	89PR20K	232502030
R34	SAME AS R33					
R35	SAME AS R17					
R36	SAME AS R17					
R37						220101536
T1		92-10KHZ		MICROT	VM15-FPB	400101100
T2	SAME AS T1					
U1	8PDIL	80MW	150	18324	N5558V	500055560
U2	SAME AS U1					
U3	SAME AS U1					
U4	SAME AS U1					
U5	SAME AS U1					

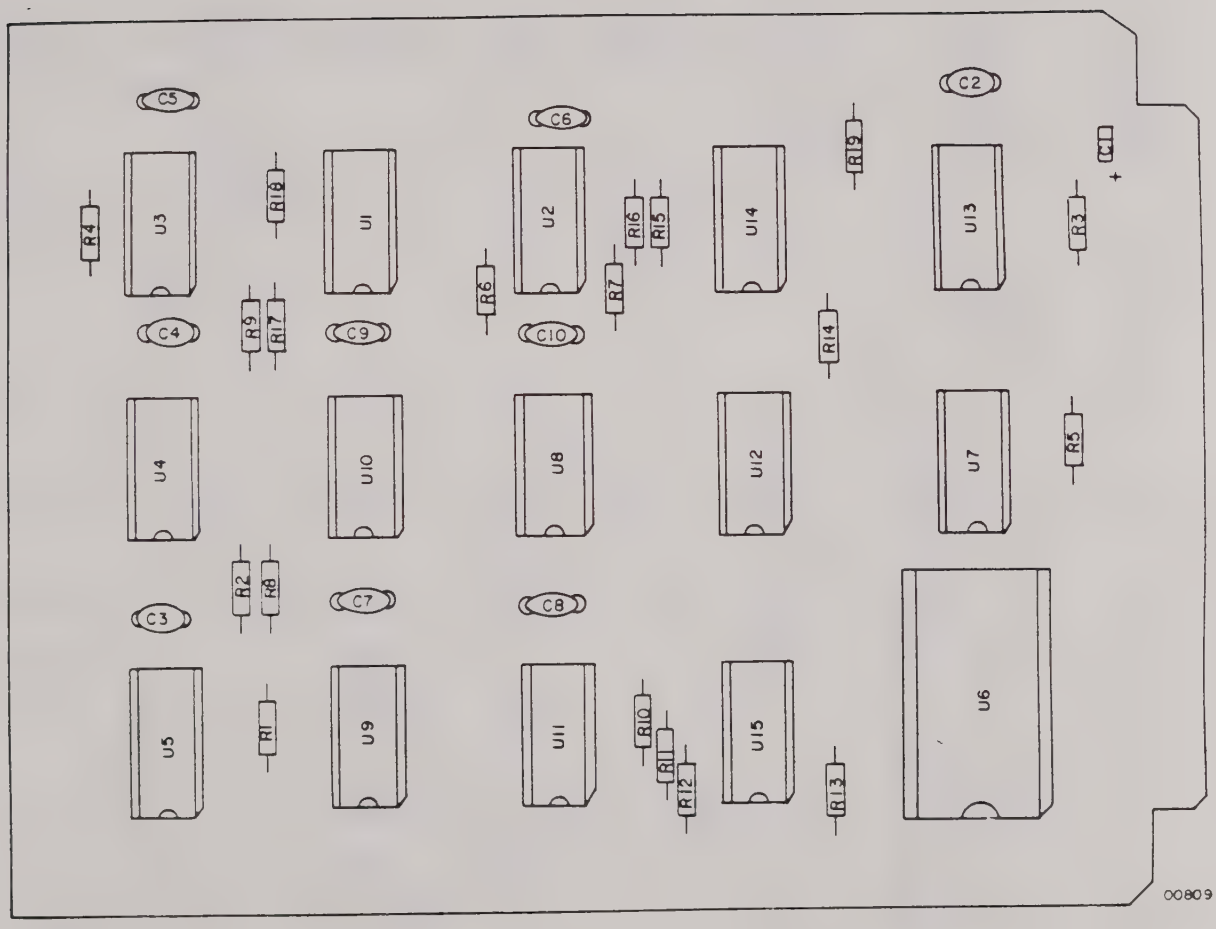


NOTE
PREFIX REFERENCE DESIGNATIONS WITH A1A14

Figure 6—12. Model 2765, Tones Filter A1A14 (96344), Component Location.

Table 6–20. Model 2765, Address Control Assy A1A15 (96345) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF 10% 6V	05397	T330A226K006AS	310002260
C2	.01UF 20% 16V	71590	UK16-103	330701031
C3	SAME AS C2			
C4	SAME AS C2			
C5	SAME AS C2			
C6	SAME AS C2			
C7	SAME AS C2			
C8	SAME AS C2			
C9	SAME AS C2			
C10	SAME AS C2			
R1	1K 1/4W 10%	01121	TYPE CB	200101026
R2	SAME AS R1			
R3	SAME AS R1			
R4	SAME AS R1			
R5	SAME AS R1			
R6	SAME AS R1			
R7	SAME AS R1			
R8	SAME AS R1			
R9	SAME AS R1			
R10	SAME AS R1			
R11	SAME AS R1			
R12	SAME AS R1			
R13	SAME AS R1			
R14	SAME AS R1			
R15	SAME AS R1			
R16	SAME AS R1			
R17	SAME AS R1			
R18	SAME AS R1			
R19	SAME AS R1			
U1	14PDIL	TI	SN7403N	510074030
U2	DILP	01295	SN7408N14P	510074080
U3	DILP	01295	SN7404N14P	510074040
U4	16DILP	01295	SN7476N	510074760
U5	14DILP	01295	SN7473N	510074730
U6	SYSTEM BASIC PROG U6A			A276500052
U7	14DILP	BECKMAN	899-1-R2K	514500100
U8	14DILP	TI	SN74177N	510074177
U9	16DILP	01295	SN74151N	510074151
U10	16DILP	T.I.	SN7485N	510074850
U11	14DILP	01295	SN7410N	510074100
U12	14DILP	TI	SN7412N	510007412
U13	SAME AS U12			
U14	SAME AS U1			
U15	DILP	01295	SN7407N14P	510074070
U19	SAME AS U2			
XU6	SKT IC 24P PC	91506	324-AG2D	820100700



NOTE:

U6 IS A PROGRAMMABLE UNIT (PROM). PROM USED IN BASIC MODEL 2765 HAS A C052 PROGRAM AND IS MARKED U6A. FOR OTHER PROGRAMS, PROMS ARE MARKED U6B, U6C, ETC.

2. PREFIX REFERENCE DESIGNATIONS WITH A1A15.

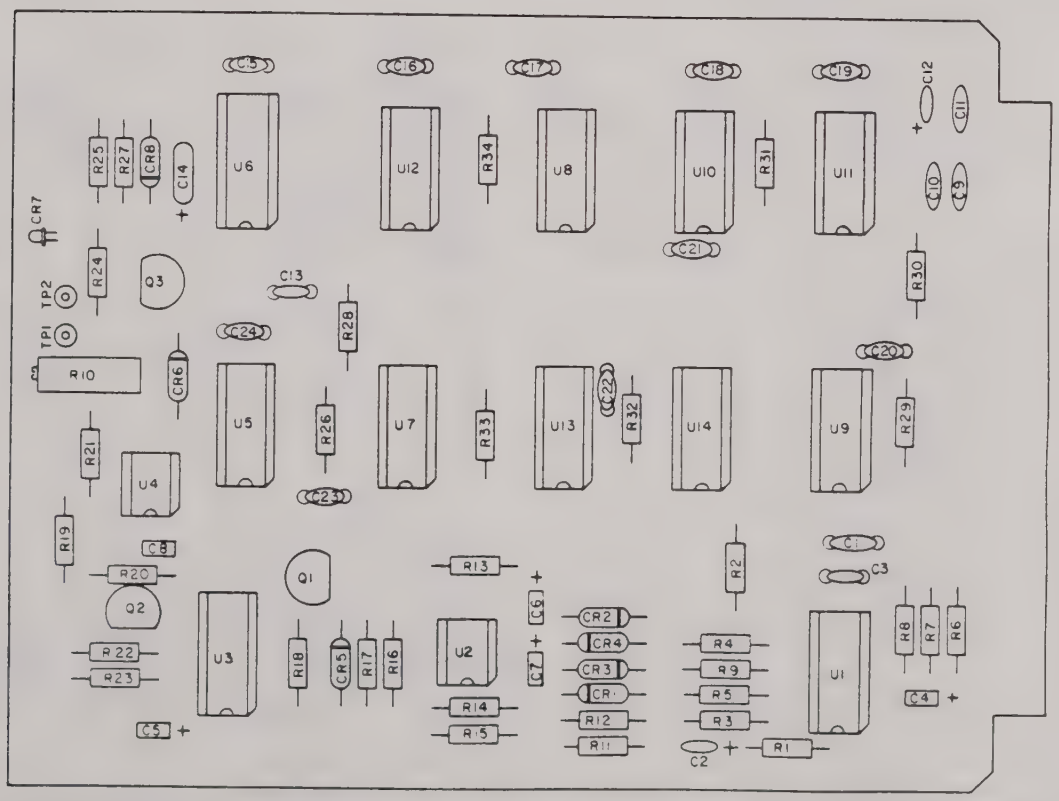
Figure 6 – 13. Model 2765, Address Control A1A15 (96345), Component Location.

Table 6—21. Model 2765, Tones and Ringback Detector (low) A1A16 (96506) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	1.0UF	Y5V TC 20%	50V	72982	8131-050-651-105M	330801050
C2	22UF	10%	15V	SPRAGUE	196D226X9015KA1	310802263
C3	150PF	S3NTC 10%	1KV	71590	DD-151	330001510
C4	1UF	10%	35V	05397	T330A105K035AS	310001051
C5	4.7UF	10%	25V	05397	T330A475K025AS	310004751
C6	SAME AS C4					
C7	SAME AS C4					
C8	.1UF	Y5V TC 20%	50V	72982	8121-050-651-104M	330801040
C9	.01UF	Z5UTC GMV	1KV	71590	DD-103	330101030
C10	SAME AS C9					
C11	SAME AS C9					
C12	SAME AS C2					
C13	SAME AS C1					
C14	10UF	10%	10V	05397	T330A106K010AS	310001060
CR1	DO35	500MW	20V	12065	1N4148	560041480
CR2	SAME AS CR1					
CR3	SAME AS CR1					
CR4	SAME AS CR1					
CR5	SAME AS CR1					
CR6	SAME AS CR1					
CR7	LED	75MA	1.6V	LITRONIX	RED-LIT2	564500100
CR8	SAME AS CR1					
Q1	TO92AFA	310MW	25V	04713	MPS6515	550065150
Q2	TO92	1-5MA	25V	04713	MPF103 2N5457	554001030
Q3	SAME AS Q1					
R1	10K	1/8W 1%		19701	MF5C	220210021
R2	2.2K	1/4W 10%		01121	TYPE CB	200102226
R3	SAME AS R1					
R4	909-	1/8W 1%		19701	MF5C	220290901
R5	2.7K	1/4W 10%		01121	TYPE CB	200102726
R6	6.8K	1/4W 10%		01121	TYPE CB	200106826
R7	562-	1/8W 1%		19701	MF5C	220256201
R8	SAME AS R7					
R9	SAME AS R4					
R10	100K	.75W 10		80294	89PR100K	232501040
R11	SAME AS R2					
R12	270K	1/4W 10%		01121	TYPE CB	200102746
R13	100K	1/8W 1%		19701	MF5C	220210031
R14	SAME AS R13					
R15	1K	1/4W 10%		01121	TYPE CB	200101026
R16	3.3M	1/4W 10%		01121	TYPE CB	200103356
R17	12K	1/4W 10%		01121	TYPE CB	200101236
R18	3.9K	1/4W 10%		01121	TYPE CB	200103926
R19	1M	1/4W 10%		01121	TYPE CB	200101056
R20	210K	1/8W 1%		19701	MF5C	220221031
R21	3480-	1/8W 1%		19701	MF5C	220234811
R22	SAME AS R15					
R23	3160-	1/8W 1%		19701	MF5C	220231611
R24	SAME AS R17					
R25	SAME AS R15					
R26	470-	1/4W 10%		01121	TYPE CB	200104716
R27	47K	1/4W 10%		01121	TYPE CB	200104736
R28	22-	1/4W 10%		01121	TYPE CB	200102206
R29	SAME AS R2					
R30	SAME AS R15					
R31	SAME AS R2					

Table 6—21 (cont'd)

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R32	SAME AS R2					
R33	SAME AS R2					
R34	SAME AS R2					
U1	14DILP			49671	CA3050	500030500
U2	8PDIL	80MW	180	18324	N5558V	500055580
U3	14PDIL			TI	SN7403N	510074030
U4	SAME AS U2					
U5	14DILP			TI	SN7414N	510007414
U6	16DILP			TI	SN74123N	510074123
U7	14DILP			01295	SN7474N	510074740
U8	14DILP			01295	SN7473N	510074730
U9	SAME AS U8					
U10	14DILP			01295	SN7490N	510074900
U11	SAME AS U10					
U12	SAME AS U10					
U13	SAME AS U3					
U14	SAME AS U3					



NOTE

CR7 MOUNTED WITH BEAD STANDOFFS AND BENT AS SHOWN. FLAT SIDE OF CR7 IS TO THE LEFT

2 PREFIX REFERENCE DESIGNATIONS WITH A1A16

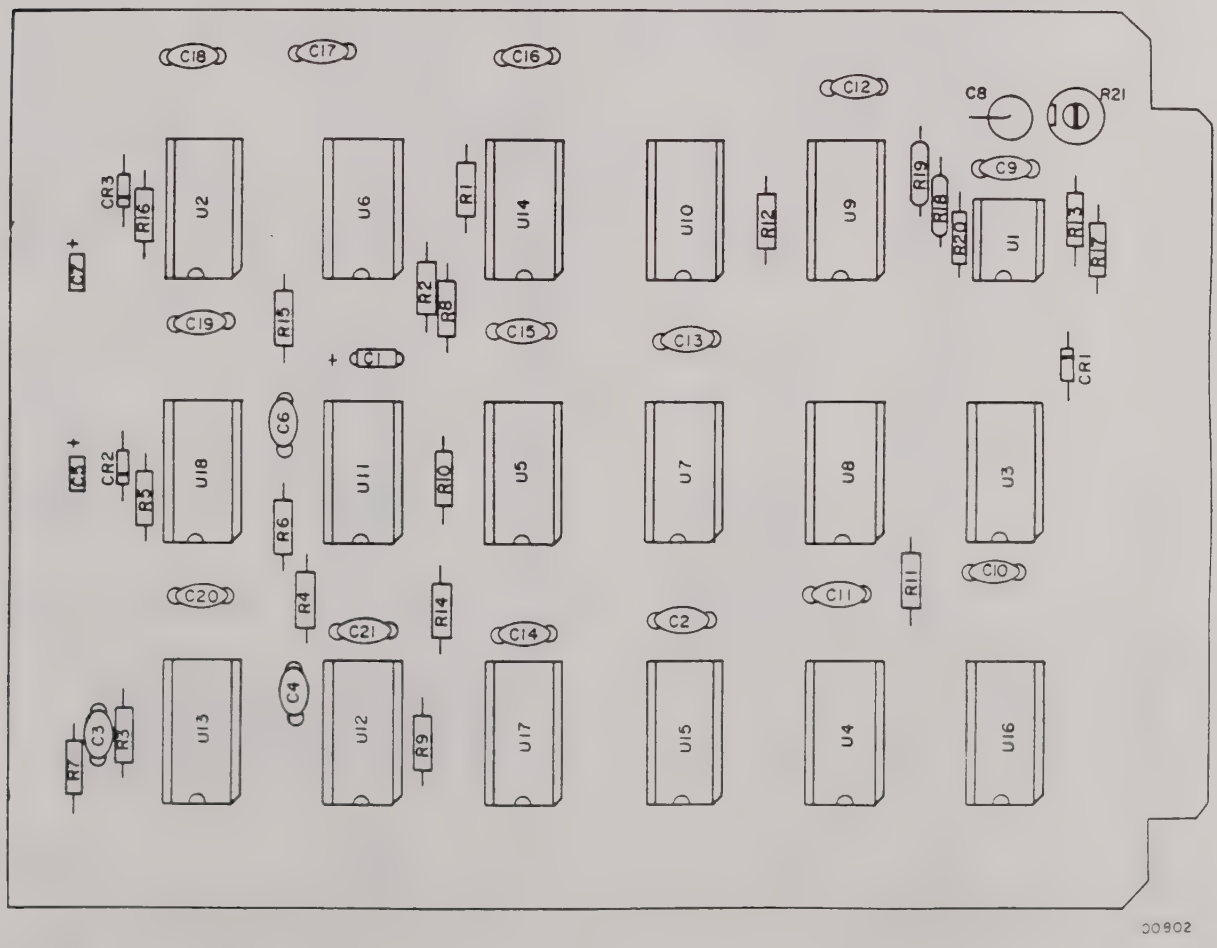
Figure 6—14. Model 2765, Tones and Ringback Detector (low), A1A16 (96506), Component Location.

Table 6–22. Model 2765, Data Control Assy A1A17 (96330) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION				MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF		10%	6V	05397	T330A226K006AS	310002260
C2	.01UF		20%	16V	71590	UK16-103	330701031
C3	SAME AS C2						
C4	SAME AS C2						
C5	1UF		10%	35V	05397	T330A105K035AS	310001051
C6	SAME AS C2						
C7	SAME AS C5						
C8	.011UF		.5%	100V	27735	PC11-.011-100-.5	322201130
C9	SAME AS C2						
C10	SAME AS C2						
C11	SAME AS C2						
C12	SAME AS C2						
C13	SAME AS C2						
C14	SAME AS C2						
C15	SAME AS C2						
C16	SAME AS C2						
C17	SAME AS C2						
C18	SAME AS C2						
C19	SAME AS C2						
C20	SAME AS C2						
C21	SAME AS C2						
CR1	A-1	400MW	5%	12V	12065	1N759A	562007591
CR2	DO35	500MW		20V	12065	1N4148	560041480
CR3	SAME AS CR2						
R1	1K	1/4W	10%		01121	TYPE CB	200101026
R2	2.2K	1/4W	10%		01121	TYPE CB	200102226
R3	10K	1/4W	10%		01121	TYPE CB	200101036
R4	SAME AS R3						
R5	SAME AS R3						
R6	4.7K	1/4W	10%		01121	TYPE CB	200104726
R7	SAME AS R2						
R8	SAME AS R1						
R9	SAME AS R2						
R10	SAME AS R2						
R11	SAME AS R1						
R12	SAME AS R1						
R13	SAME AS R1						
R14	SAME AS R1						
R15	SAME AS R1						
R16	SAME AS R3						
R17	100-	1/4W	10%		01121	TYPE CB	200101016
R18	475K	1/8W	.5%		ELECTRA	MF5C	220347537
R19	392K	1/8W	.5%		ELECTRA	MF5C	220339237
R20	SAME AS R1						
R21	20K	1/2W	10%	200V	HILIPOT	62P20K	232702036
U1	8DILP			5-15	SIGNETICS	SE555	510000555
U2	16DILP				TI	SN74123N	510074123
U3	16DILP			MOS	FAIRCHILD	3341	514000200
U4	SAME AS U3						
U5	14DILP				TI	SN7412N	510007412

Table 6—22 (cont'd)

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
U6	14DILP	01295	SN7474N	510074740
U7	14DILP	01295	SN7430N	510074300
U8	8-BIT SHIFT REG PAR.LD	TI	SN74165N	510074165
U9	14DILP	01295	SN7400N	510074000
U10	DILP	01295	SN7404N14P	510074040
U11	14DILP	01295	SN7406N14P	510074060
U12	14DILP	01295	SN7473N	510074730
U13	SAME AS U2			
U14	DIL	01295	SN7413N14P	510074130
U15	14DILP	01295	SN7490N	510074900
U16	8-BIT ODD/EVEN PAR.GEN.	TI	SN74180N	510074180
U17	SAME AS U12			
U18	SAME AS U2			
XU1	SKT IC LOW PROF 8PDIL	02660	583640-1	820000400

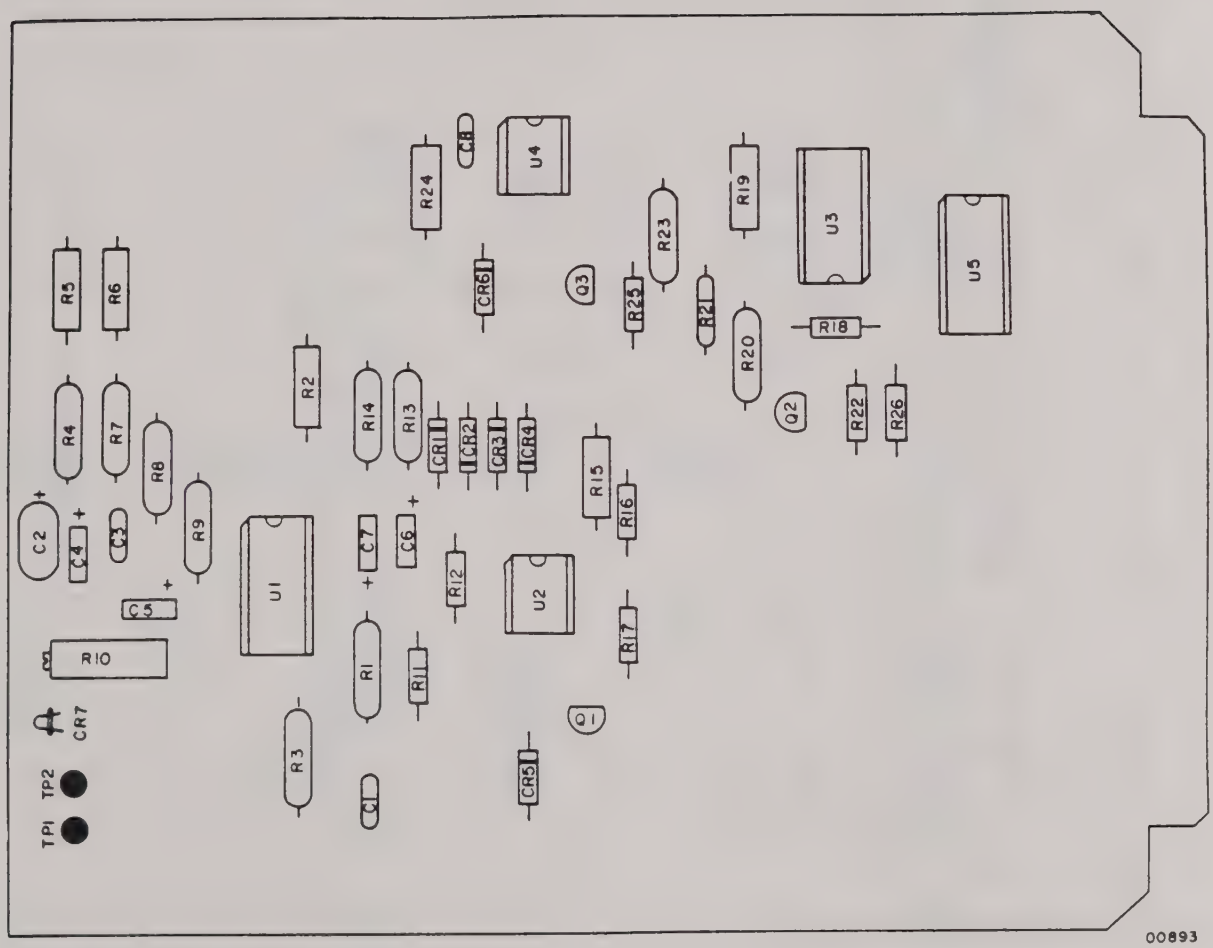


NOTE:
PREFIX REFERENCES DESIGNATIONS WITH A1A17.

Figure 6—15. Model 2765, Data Control, A1A17 (96330), Component Location.

Table 6—23. Model 2765, Tones Detector (high) Assy A1A18 (96342) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	1.0UF	Y5V TC 20%	50V	72982	8131-050-651-105M	330801050
C2	22UF	10%	15V	SPRAGUE	196D226X9015KA1	310802263
C3	150PF	S3NTC 10%	1KV	71590	DD-151	330001510
C4	1UF	10%	35V	05397	T330A105K035AS	310001051
C5	4.7UF	10%	25V	05397	T330A475K025AS	310004751
C6	SAME AS C4					
C7	SAME AS C4					
C8	.1UF	Y5V TC 20%	50V	72982	8121-050-651-104M	330801040
CR1	D035	500MW	20V	12065	1N4148	560041480
CR2	SAME AS CR1					
CR3	SAME AS CR1					
CR4	SAME AS CR1					
CR5	SAME AS CR1					
CR6	SAME AS CR1					
CR7	LED	75MA	1.6V	LITRONIX	RED-LIT2	564500100
Q1	TO92AFA	310MW	25V	04713	MPS6515	550065150
Q2	TO92	1-5MA	25D	04713	MPF103 2N5457	554001030
Q3	SAME AS Q1					
R1	10K	1/8W 1%		19701	MF5C	220210021
R2	2.2K	1/4W 10%		01121	TYPE CB	200102226
R3	SAME AS R1					
R4	909-	1/8W 1%		19701	MF5C	220290901
R5	2.7K	1/4W 10%		01121	TYPE CB	200102726
R6	6.8K	1/4W 10%		01121	TYPE CB	200106826
R7	562-	1/8W 1%		19701	MF5C	220256201
R8	SAME AS R7					
R9	SAME AS R4					
R10	100K	.75W 10		80294	89PR100K	232501040
R11	SAME AS R2					
R12	270K	1/4W 10%		01121	TYPE CB	200102746
R13	100K	1/8W 1%		19701	MF5C	220210031
R14	SAME AS R13					
R15	1K	1/4W 10%		01121	TYPE CB	200101026
R16	3.3M	1/4W 10%		01121	TYPE CB	200103356
R17	12K	1/4W 10%		01121	TYPE CB	200101236
R18	3.9K	1/4W 10%		01121	TYPE CB	200103926
R19	1M	1/4W 10%		01121	TYPE CB	200101056
R20	39K	1/4W 10%		01121	TYPE CB	200103936
R21	3480-	1/8W 1%		19701	MF5C	220234811
R22	SAME AS R15					
R23	3160-	1/8W 1%		19701	MF5C	220231611
R24	SAME AS R17					
R25	SAME AS R15					
R26	470-	1/4W 10%		01121	TYPE CB	200104716
U1	14DILP			49671	CA3050	500030500
U2	8PDIL	80MW	18D	18324	N5558V	500055580
U3	14PDIL			TI	SN7403N	510074030
U4	SAME AS U2					
U5	14DILP			TI	SN7414N	510007414



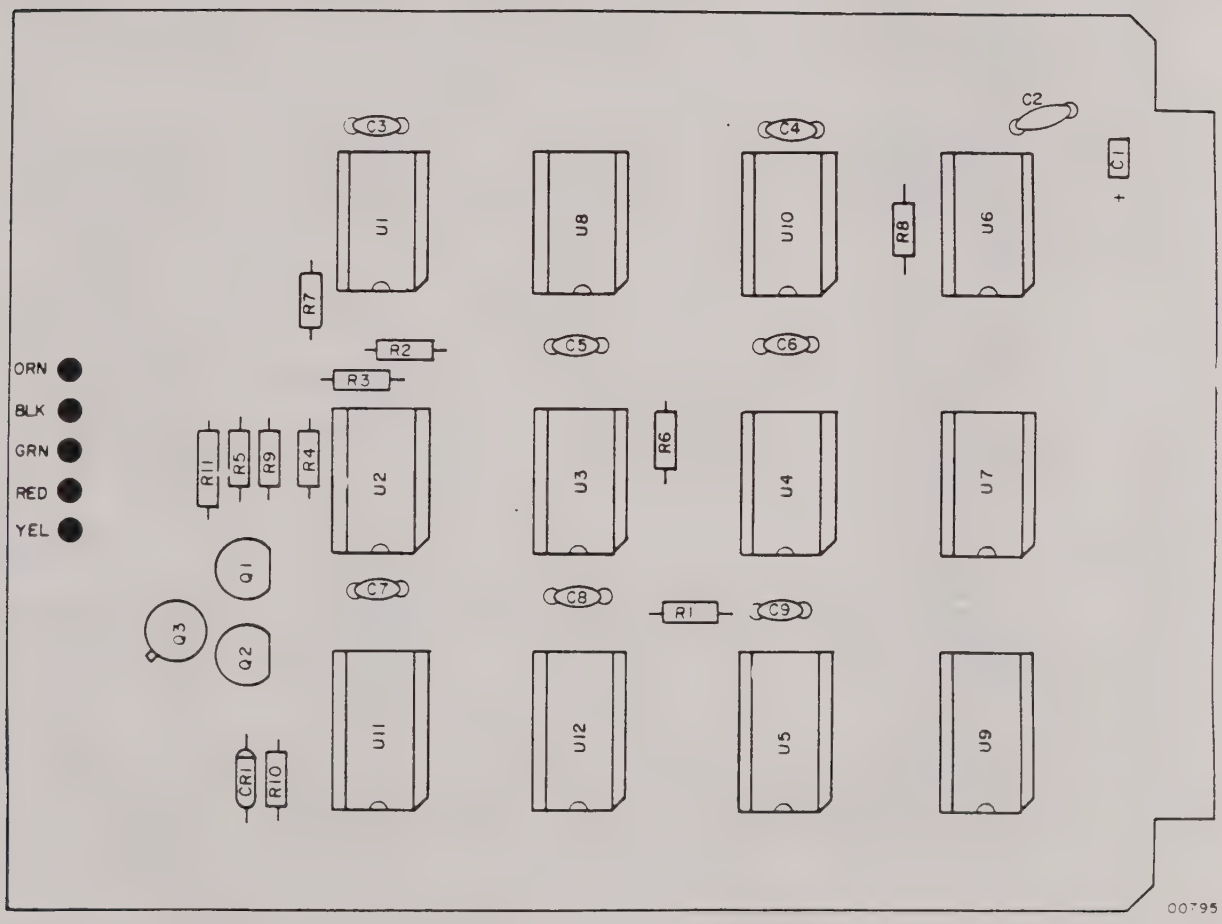
NOTES:

1. CR7 LIGHT EMITTING DIODE MOUNTED ON BEADED STANDOFFS, LEADS BENT UPWARD SO LENSE FACES TOP OF PC BOARD. FLAT SIDE OF LENSE TOWARD TP2.
2. PREFIX REFERENCE DESIGNATIONS WITH A1A18.

Figure 6–16. Model 2765 Tones Detector (high), A1A18 (96342), Component Location.

Table 6—24. Model 2765, Call Inhibit Control Assy A1A19 (96331) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF	10%	6V	05397	T330A226K006AS	310002260
C2	.01UF	20%	16V	71590	UK16-103	330701031
C3	SAME AS C2					
C4	SAME AS C2					
C5	SAME AS C2					
C6	SAME AS C2					
C7	SAME AS C2					
C8	SAME AS C2					
C9	SAME AS C2					
CR1	DO35	500MW	20V	12065	1N4148	560041480
Q1	TO92AFA	310MW	25V	04713	MPS6515	550065150
Q2	SAME AS Q1					
Q3	TO5HNS	1W	65V	49671	2N2102	550021020
R1	1K	1/4W 10%		01121	TYPE CB	200101026
R2	SAME AS R1					
R3	SAME AS R1					
R4	SAME AS R1					
R5	100-	1/2W 10%		01121	TYPE EB	200201016
R6	2.2K	1/4W 10%		01121	TYPE CB	200102226
R7	SAME AS R6					
R8	SAME AS R6					
R9	SAME AS R1					
R10	SAME AS R1					
R11	470-	1W 10%		AB	TYPE GB	200304716
U1	14DILP			01295	SN7400N	510074000
U2	14DILP			01295	SN7473N	510074730
U3	14DILP			01295	SN7474N	510074740
U4	DILP			01295	SN7408N14P	510074080
U5	SAME AS U2					
U6	14DILP			01295	SN7405N	510074050
U7	SAME AS U6					
U8	14PDIL			TI	SN7403N	510074030
U9	SAME AS U8					
U10	SAME AS U3					
U11	16DILP			T.I.	SN7485N	510074850
U12	SAME AS U11					

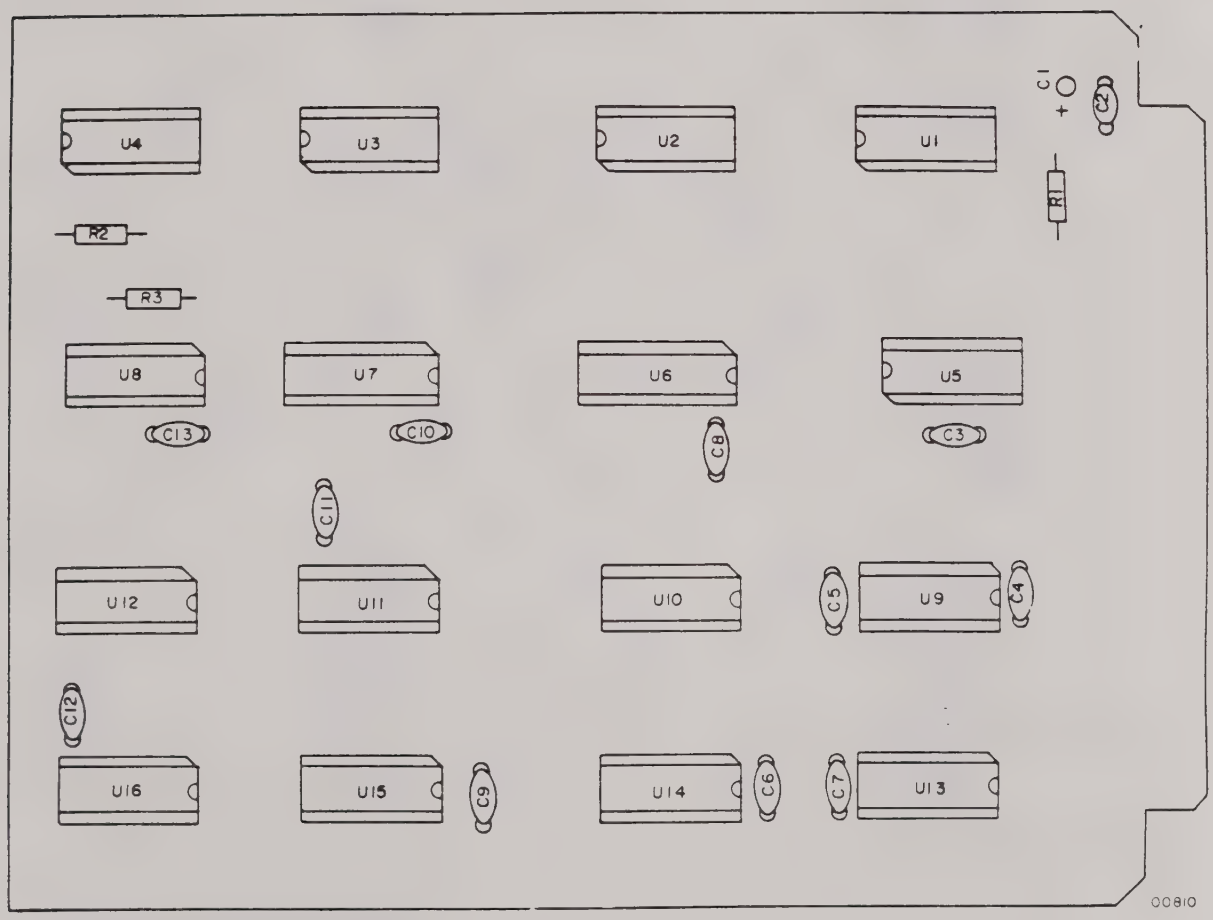


NOTE:
1. PREFIX REFERENCE DESIGNATIONS WITH A1A19

Figure 6–17. Model 2765, Call Inhibit Control, A1A19 (96331), Component Location.

Table 6–25. Model 2765, Digital Timer Assy A1A20 and A22 (96346) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF 20% 10V	13606	196D226X0010JA1	310802260
C2	.01UF 20% 16V	71590	UK16-103	330701031
C3	SAME AS C2			
C4	SAME AS C2			
C5	SAME AS C2			
C6	SAME AS C2			
C7	SAME AS C2			
C8	SAME AS C2			
C9	SAME AS C2			
C10	SAME AS C2			
C11	SAME AS C2			
C12	SAME AS C2			
C13	SAME AS C2			
R1	2.2K 1/4w 10%	01121	TYPE CB	200102226
R2	SAME AS R1			
R3	SAME AS R1			
U1	14DILP	TI	SN7412N	510007412
U2	SAME AS U1			
U3	SAME AS U1			
U4	SAME AS U1			
U5	14DILP	01295	SN7490N	510074900
U6	16 DILP	TI	SN74174N	510074174
U7	SAME AS U6			
U8	14DILP	01295	SN7474N	510074740
U9	14DILP	01295	SN74164N	510074164
U10	SAME AS U9			
U11	SAME AS U9			
U12	14DILP	TI	SN7414N	510007414
U13	SAME AS U8			
U14	SAME AS U9			
U15	IC,QUAD 2-IN POS OR GT	01295	SN7432N	510074320
U16	SAME AS U15			

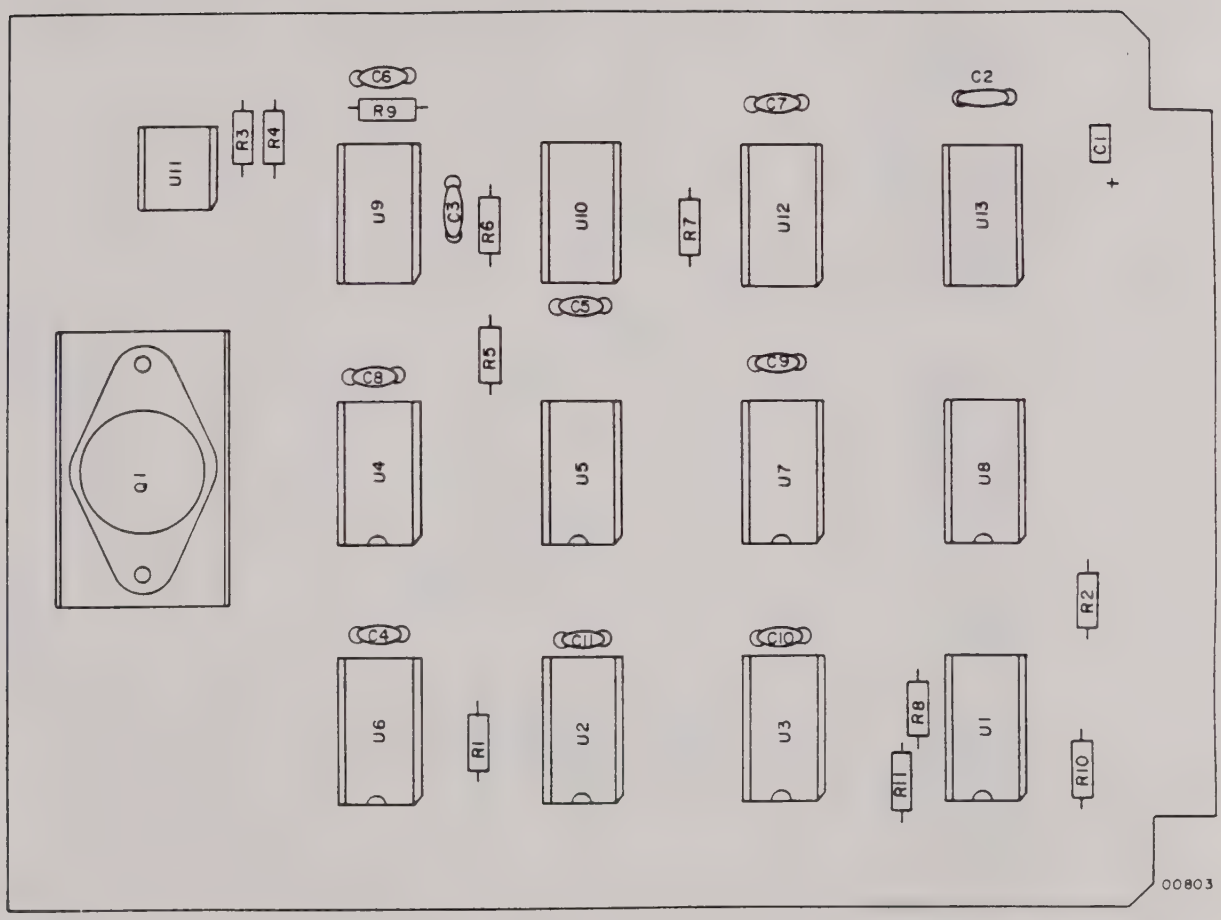


NOTE:
1. PREFIX REFERENCE DESIGNATIONS WITH A1A20 OR A1A22 AS APPROPRIATE.

Figure 6–18. Model 2765, Digital Timer, A1A20 and 22 (96346), Componnet Location.

Table 6–26. Model 2765, Print Control Assy A1A23 (96510), Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF	10%	6V	05397	T330A226K006AS	310C02260
C2	.01UF	20%	16V	71590	UK16-103	330701031
C3	SAME AS C2					
C4	SAME AS C2					
C5	SAME AS C2					
C6	SAME AS C2					
C7	SAME AS C2					
C8	SAME AS C2					
C9	SAME AS C2					
C10	SAME AS C2					
C11	SAME AS C2					
Q1	LPA	25W	40V	04713	2N4898	552048980
R1	1K	1/4W	10%	01121	TYPE CB	200101026
R2	330-	1/4W	10%	01121	TYPE CB	200103316
R3	4990-	1/8W	1%	19701	MF5C	220249911
R4	12.1K	1/8W	1%	19701	MF5C	220212121
R5	SAME AS R1					
R6	10K	1/4W	10%	01121	TYPE CB	200101036
R7	SAME AS R1					
R8	SAME AS R1					
R9	SAME AS R1					
R10	SAME AS R1					
R11	SAME AS R1					
U1	14DILP			01295	SN7400N	510074000
U2	14DILP			01295	SN7474N	510074740
U3	SAME AS U2					
U4	SAME AS U2					
U5	14DILP			01295	SN7410N	510074100
U6	14DILP		500V	01295	SN7402N	510074020
U7	14DILP			TI	SN7414N	510007414
U8	14DILP			01295	SN7405N	510074050
U9	SAME AS U8					
U10	16DILP			TI	SN74123N	510074123
U11	8PDIL	00MW	180	18324	N5741V	500057410
U12	SAME AS U2					
U13	SAME AS U2					



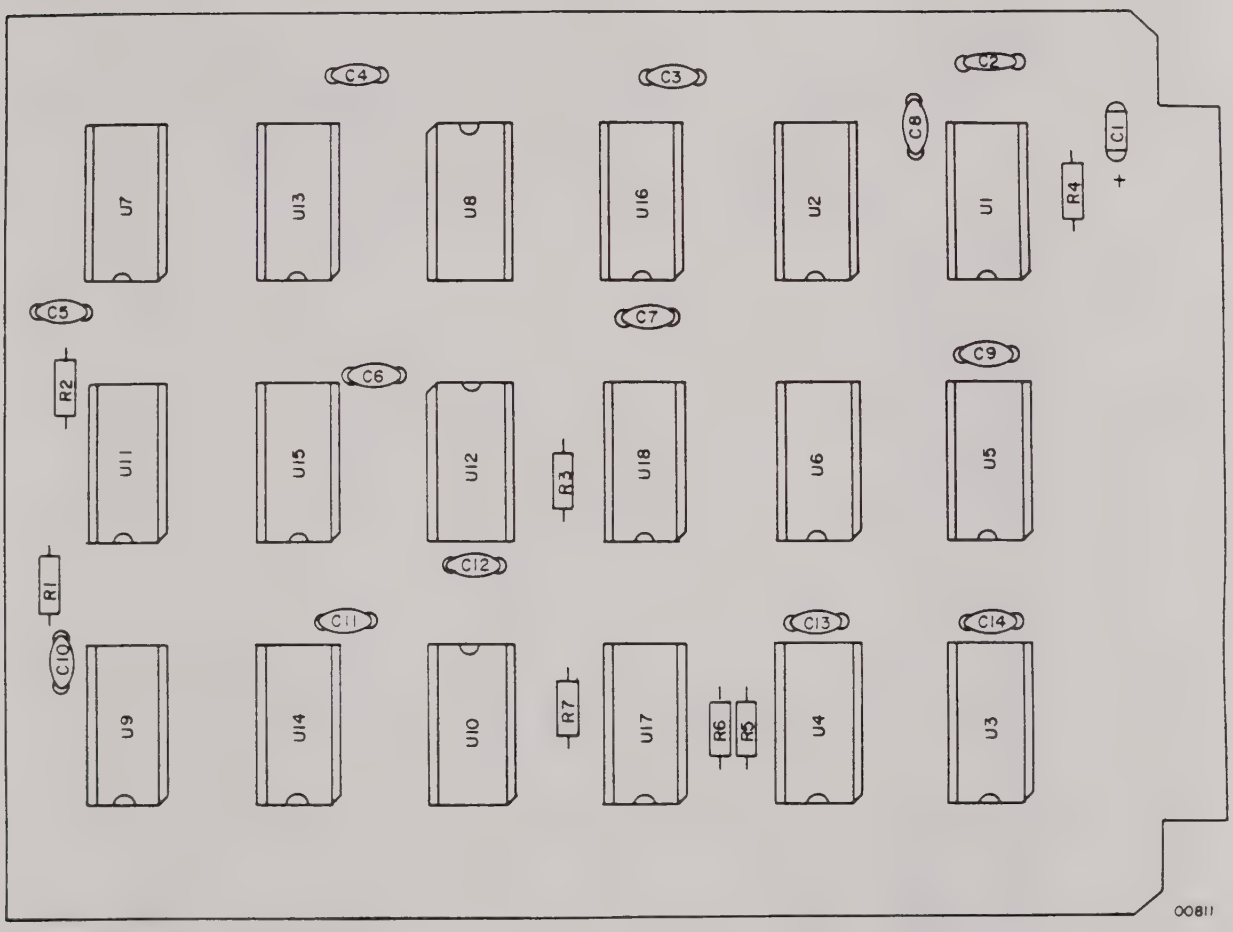
NOTE:

1. MICA SLICE AND SILICON GREASE USED UNDER Q1 WHEN MOUNTED ON HEAT SINK. DO NOT USE INSULATING WASHERS.
2. PREFIX REFERENCE DESIGNATIONS WITH A1A23.

Figure 6 – 19. Model 2765, Print Control, A1A23 (96510), Component Location.

Table 6—27. Model 2765, Disposition Timers Assy A1A25 (96505) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION				MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF		10%	6V	05397	T330A226K006AS	310002260
C2	.01UF		20%	16V	71590	UK16-103	330701031
C3	SAME AS C2						
C4	SAME AS C2						
C5	SAME AS C2						
C6	SAME AS C2						
C7	SAME AS C2						
C8	SAME AS C2						
C9	SAME AS C2						
C10	SAME AS C2						
C11	SAME AS C2						
C12	SAME AS C2						
C13	SAME AS C2						
C14	SAME AS C2						
R1	1K	1/4W	10%		01121	TYPE CB	200101026
R2	2.2K	1/4W	10%		01121	TYPE CB	200102226
R3	SAME AS R2						
R4	SAME AS R2						
R5	SAME AS R2						
R6	SAME AS R2						
R7	SAME AS R2						
U1	16DILP				01295	SN7475N	510074750
U2	SAME AS U1						
U3	SAME AS U1						
U4	SAME AS U1						
U5	SAME AS U1						
U6	SAME AS U1						
U7	16DILP				01295	SN74192	510074192
U8	SAME AS U7						
U9	SAME AS U7						
U10	SAME AS U7						
U11	SAME AS U7						
U12	SAME AS U7						
U13	16DILP	SCHOTKY			TI	SN74S257N	510874257
U14	SAME AS U13						
U15	SAME AS U13						
U16	14DILP				01295	SN7406N14P	510074060
U17	16DILP				01295	SN7445N	510074450
U18	14DILP				01295	SN7410N	510074100

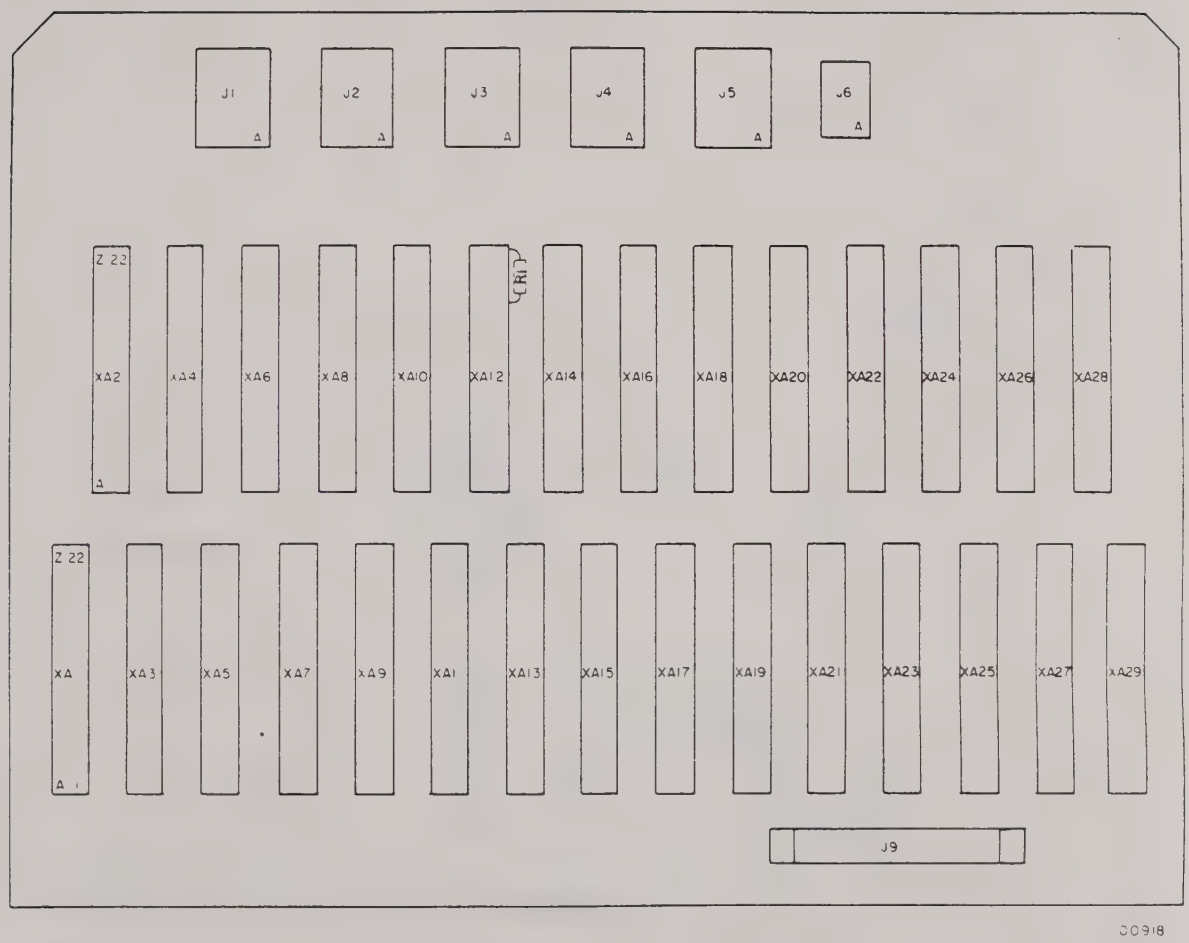


NOTE:
1. PREFIX REFERENCE DESIGNATIONS WITH A1A25

Figure 6–20. Model 2765, Disposition Timers, A1A25 (96505), Component Location.

Table 6—28. Model 2765, Interconnection Board Assy A1A30 Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
J1	38PIN STUFFED	ELCO	8016-038-296-707	653205800
J2	SAME AS J1			
J3	SAME AS J1			
J4	SAME AS J1			
J5	SAME AS J1			
J6	20PIN STUFFED	ELCO	8016-020-296-707	653205900
J9	50PIN	3M CO.	3433-2003	654000400
R1	2.2K 1/2W 10%	01121	TYPE EB	200202226
XA1	CONN PC 44-PIN DUAL	AMP	67798-2	651901100
XA2	SAME AS XA1			
XA3	SAME AS XA1			
XA4	SAME AS XA1			
XA5	SAME AS XA1			
XA6	SAME AS XA1			
XA7	SAME AS XA1			
XA8	SAME AS XA1			
XA9	SAME AS XA1			
XA10	SAME AS XA1			
XA11	SAME AS XA1			
XA12	SAME AS XA1			
XA13	SAME AS XA1			
XA14	SAME AS XA1			
XA15	SAME AS XA1			
XA16	SAME AS XA1			
XA17	SAME AS XA1			
XA18	SAME AS XA1			
XA19	SAME AS XA1			
XA20	SAME AS XA1			
XA21	SAME AS XA1			
XA22	SAME AS XA1			
XA23	SAME AS XA1			
XA24	SAME AS XA1			
XA25	SAME AS XA1			
XA26	SAME AS XA1			
XA27	SAME AS XA1			
XA28	SAME AS XA1			
XA29	SAME AS XA1			



NOTE:

1. PREFIX REFERENCE DESIGNATIONS WITH A1A30.

Figure 6–21. Model 2765, Interconnection Board Assembly A1A30 Component Location.

Table 6—29. Model 2765, Front Panel Assembly A1A31, Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
A1	POWER SUPPLY ASSY			A276500016
A2	CKT BD THUMB WHEELS			A276500050
DS1	60MA 5V	DATA DISPL	F62-A1-R0	730200500
DS2	30MA 5V	DATA DISPL	F62-A1-W0	730200300
DS3	20MA 5V	MONSANTO	MV5023	564500900
S1	DPDT 5A 28V	09353	7201P	620400600
S2	SAME AS S1			
S3	SPDT 1A 28V	C&K	8121	635200700
S4	SAME AS S3			
W1	FRONT PANEL CABLE			A276500019

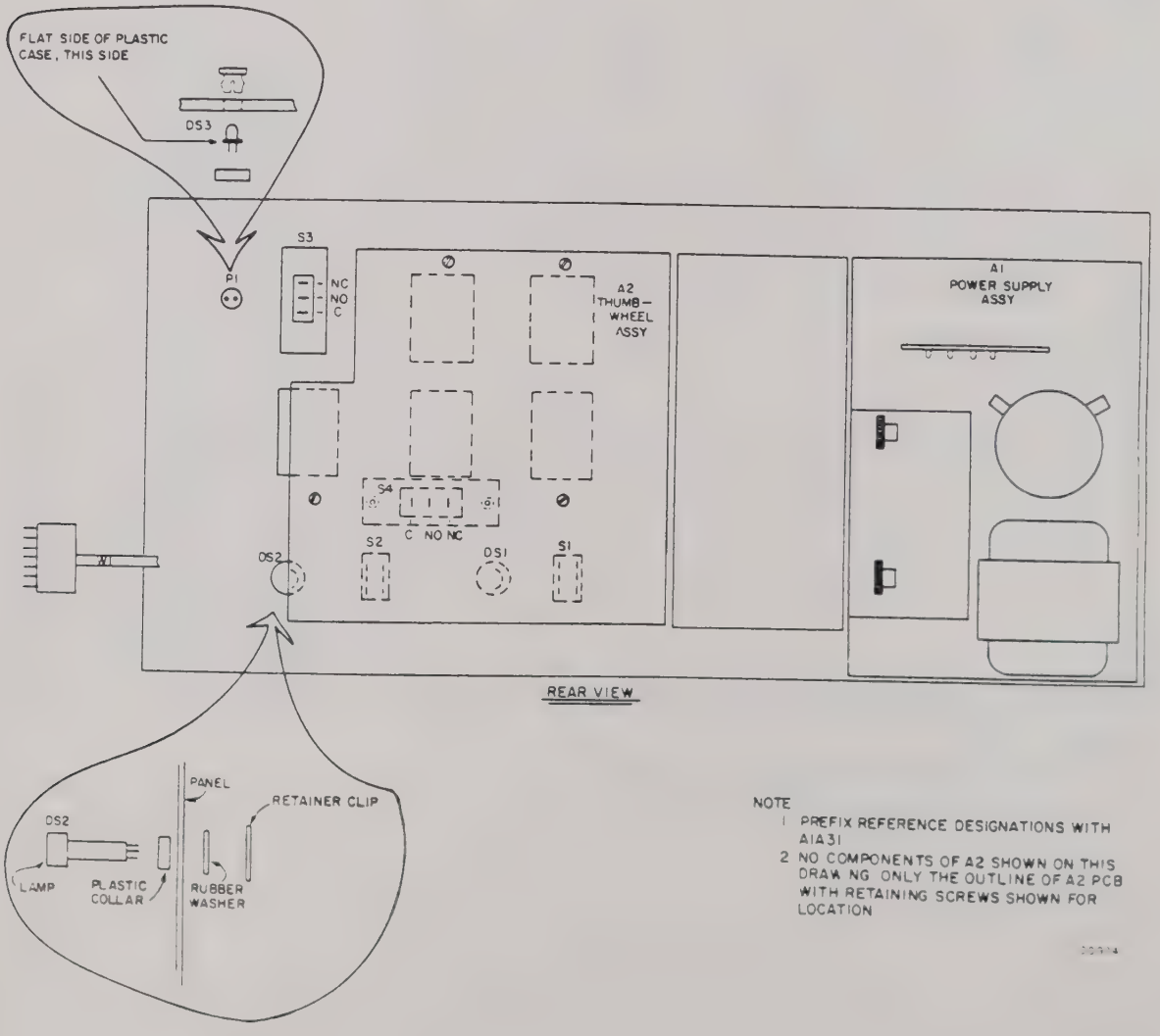
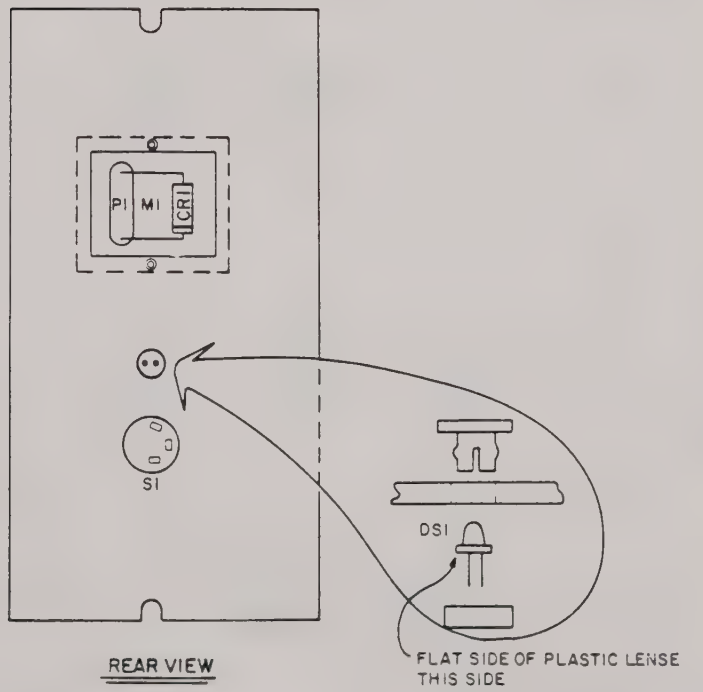


Figure 6—22. Model 2765, Front Panel Assembly A1A31, Component Location.

Table 6—30. Model 2765, 01 Output Inhibit Module Assy A1A32 Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
CR1	D041 200V	12065	1N4003	560040030
DS1	20MA 5V	MONSANTO	MV5023	564500900
M1	3.5W 12V	DURANT	4-Y-41317-401-MEG	728000500
P1	SOCKET, COUNTER	DURANT	20451-200	827200400
S1	SPDT RED	82389	903	635400100

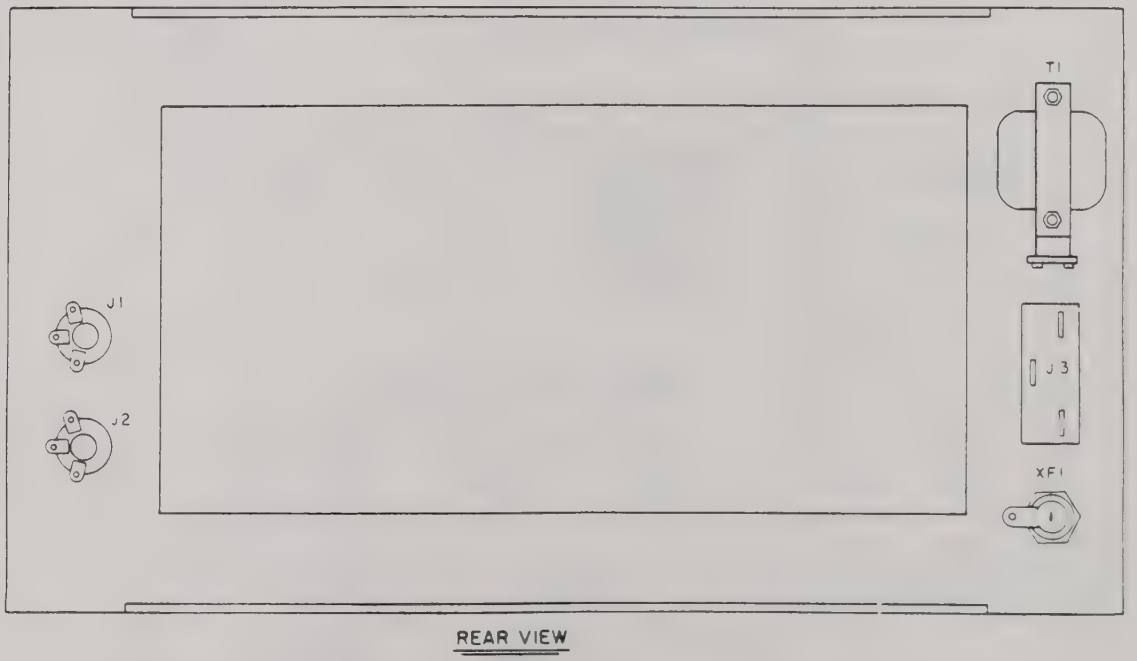


NOTE
1. PREFIX REFERENCE DESIGNATIONS WITH A1A32.

Figure 6—23. Model 2765, 01 Inhibit Module Assembly A1A32, Component Location.

Table 6—31. Model 2765 Rear Panel Assy A1A33 Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFR	MFGR PART NO	NEC PART NO
F1	1A 250V	71400	MDL	863101400
J1	Jack, TEL, SWCRFT SCHEM 4	82389	L12B	650100300
J2	SAME AS J1	CORCOM	1B4	
J3	3-WIRE	TRIAD	F 13X	652300400
T1	600MA			420101400
XF1	FUSE HOLDER, 3AG, PANEL	71400	HKP	863000100



REAR VIEW

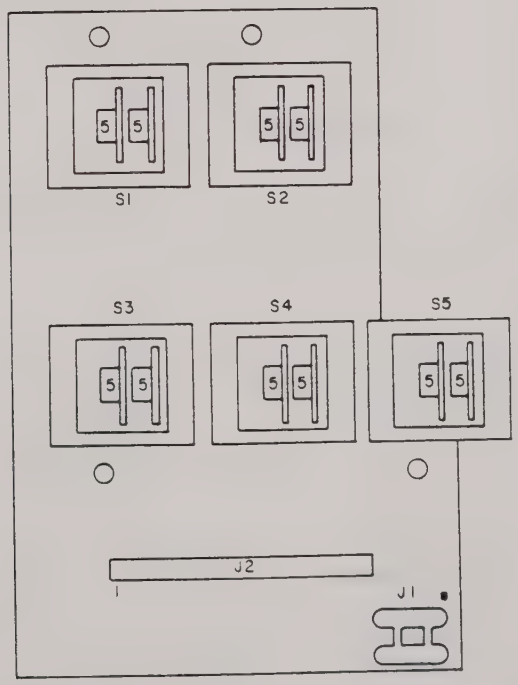
NOTE
PREFIX REFERENCE DESIGNATIONS WITH A1A33

00923

Figure 6—24. Model 2765, Rear Panel Assembly A1A33, Component Location.

Table 6—32. Model 2765, Thumbwheel Board Assy A1A31A2 (96498) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
		91506	583527 1	820100300
J1	14PDIL	MOLEX	22-03-2251	863404600
J2	TND BR			
S1	SW THMBWHL BCD COMPL	DIGISWITCH	29119-2P	626800500
S2	SAME AS S1			
S3	SAME AS S1			
S4	SAME AS S1			
S5	SAME AS S1			



NOTE:
1. PREFIX REFERENCE DESIGNATIONS WITH A1A31A2.

Figure 6—25. Model 2765, Thumbwheel Board Assembly, A1A31A2 (96498), Component Location.

Table 6—33. Model 2765, Xentek Model 2718 Power Supply Assy A1A31A1 Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR	MFGR PART NO
	REGULATOR ASSY, 5V,7A, W/OVP	XENTEK	C2718-A02
	REGULATOR ASSY, ± 15V, 0.8A	XENTEK	C2718-A03
	± 15V OVP ASSY	XENTEK	B2200-A01
C1	29K UF, 15V	CALLINS	18-65CES-29000-15-I
T1	TRANSFORMER	XENTEK	A2718-T01

REGULATOR ASSY, 5V, 7A (C2718-A02)

REFERENCE DESIGNATOR	DESCRIPTION	MFRG.	MFGR PART NO
C2	100 UF 25V	MATSUSHITA	ECE-A25V100L
C3	SELECTED		
C4,C6	0.001 UF 50V	SOLAR	
C7	1200 UF 10V	CALLINS	2-85ARO-1200-10-I
C8	0.47 UF 3V	CENTRALAB	UK474
CR1,CR2	DIODE		1N1200A
CR3-CR5	DIODE		1N4001
CR6	DIODE,ZENER		1N749A
IC1	INTEGRATED CKT	SILICON GEN/TELEDYNE	LM305AH
Q1	TRANSISTOR		2N2905A
Q2	TRANSISTOR		2N3055
Q3	TRANSISTOR		2N3771
Q4	TRANSISTOR		2N2907A
R1,R4	CARBON FILM 100 – ½W 10%		
R2	CARBON FILM 10 – ½W 10%		
R3	CARBON FILM 68 – ½W 10%		
R5	WIRE-WOUND 0.22 5W	HAMILTON-HALL/IRC	HR5W/PW5
R6	CARBON FILM 27 – ½W 10%		
R7	CARBON FILM 330 – ½W 10%		
R8	CARBON FILM 6.8K ½W 10%		
R9	POTENTIOMETER 2.5K 2W 20%	CW IND	E871-SPCA
R11	CARBON FILM 1.8K ½W 10%		
R12	CARBON FILM 2.5K ½W 10%		
R13	POTENTIOMETER 2.5K 2W 20%	CW IND.	E871-SPCA
R14	CARBON FILM 47 – ½W 10%		
R15	CARBON FILM 470 – ½W 10%		
R16	CARBON FILM 180 – ½W 10%		
SCR1	SCR	ECC	B01617

REGULATOR ASSY, ± 15, 0.8A (C2718-A03)

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR PART NO
C1,C6	1300 UF 35V	CALLINS	20-85AR01300-35I
C2,C7	0.005 UF 50V	SOLAR	
C3,C4,C8,C9	0.001 UF 50V	SOLAR	
C5,C10	100 UF 25V	MATSUSHITA	ECE-A25V100L
CR1-CR10	DIODE		1N4001
IC1,IC2	INTEGRATED CKT	SILICON GEN/TELEDYNE	LM305AH
Q1,Q3	TRANSISTOR		2N2905A
Q2,Q4	TRANSISTOR		2N3055
R1,R13	CARBON FILM 10– ½W 10%		
R2,R14	CARBON FILM 100– ½W 10%		
R3,R15	CARBON FILM 68– ½W 10%		
R4,R16	CARBON FILM 47– ½W 10%		
R5,R17	CARBON FILM 2.2K ½W 10%		
R6,R7,R18,R19	CARBON FILM 1– ½W 10%		
R9,R21	CARBON FILM 12K ½W 10%		
R10,R22	POTENTIOMETER 1K ½W	BOURNS	3386S-1-102
R11,R23	CARBON FILM 12K ½W 10%		

± 15V OVP ASSY (B2200-A01)

REFERENCE DESIGNATOR	DESCRIPTION	MFRG.	MFGR PART NO
C1	0.47 UF 3V	CENTRALAB	UK474
CR1	DIODE,ZENER		1N749A
Q1	TRANSISTOR		2N2907A
R1	SELECTED VALUE 270–		
R2	POTENTIOMETER 2.5K 2W	CW IND	E870-PCAB-0000
R3	CARBON FILM 47– ½W 10%		
R4	CARBON FILM 470– ½W 10%		
SCR1	SCR	ECC	S0503LS3

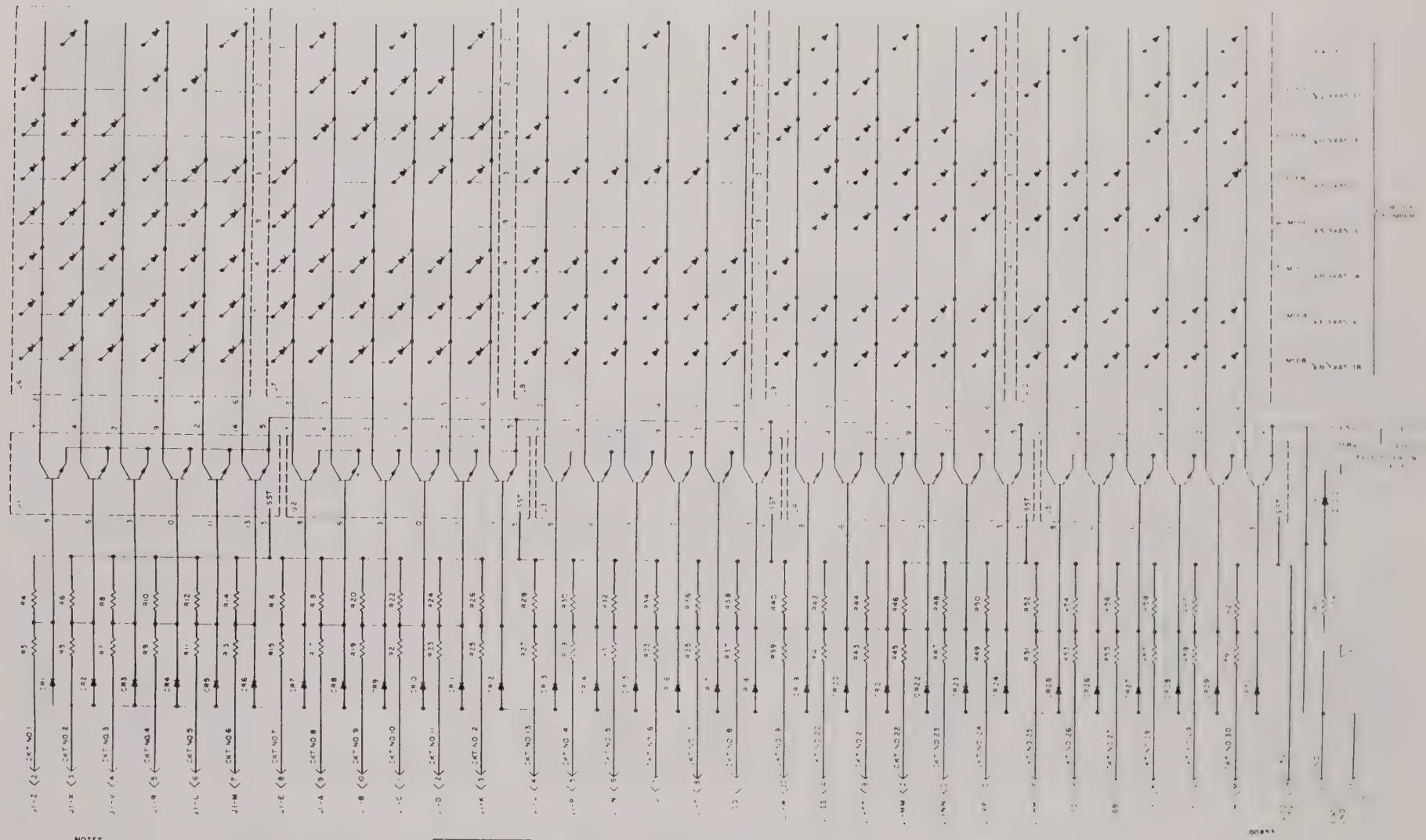
SECTION 7

SCHEMATIC DIAGRAMS

7.1 INTRODUCTION.

7.2 This section provides the schematic diagrams, Figures 7–1 through 7–21, for the Model 2765 Call Disposition Analyzer. Most of the schematics refer to decoupling capacitors used with various integrated circuits. In this context decoupling refers to the bypassing of transients to ground that might appear on the +5 volt bus. Except for the Overall Schematic Diagram, the schematics provide signal origin(s) and destination(s) under the titles FROM and TO, respectively. These reflect only the signal paths of the basic Model 2765 and the Program Analyzer option.

Figure 7-1 Model 2765, Overall Schematic Diagram



NOTES

1. UNLESS OTHERWISE INDICATED RESISTORS ARE 22K OHMS
2. DIODES CR1 - CR30 ARE TYPE IN4148
3. IC'S U1-U5 ARE TYPE CA3081
4. IC'S U6 U10 ARE TYPE TIDM2681 WHICH ARE PROGRAMABLE MATRIX UNITS. UNITS PROGRAMMED FOR PCB A2,4, AND 6 ARE MARKED A, B, AND C, RESPECTIVELY. MATRIX SHOWN IS FOR PCB A2
5. OPTIONAL PCB A4 & A6 RECEIVE INPUTS VIA J3 & J4, RESPECTIVELY, FOR CIRCUITS 31 60 & 61 90

HIGHEST REFERENCE DESIGNATIONS		
CR30	R61	U10

TYPICAL CKT NO INPUT = 0 V / 4 V

Figure 7 - 2. Model 2765, Circuit Input Buffer, A1 A2, A4, & A6 Schematic Diagram

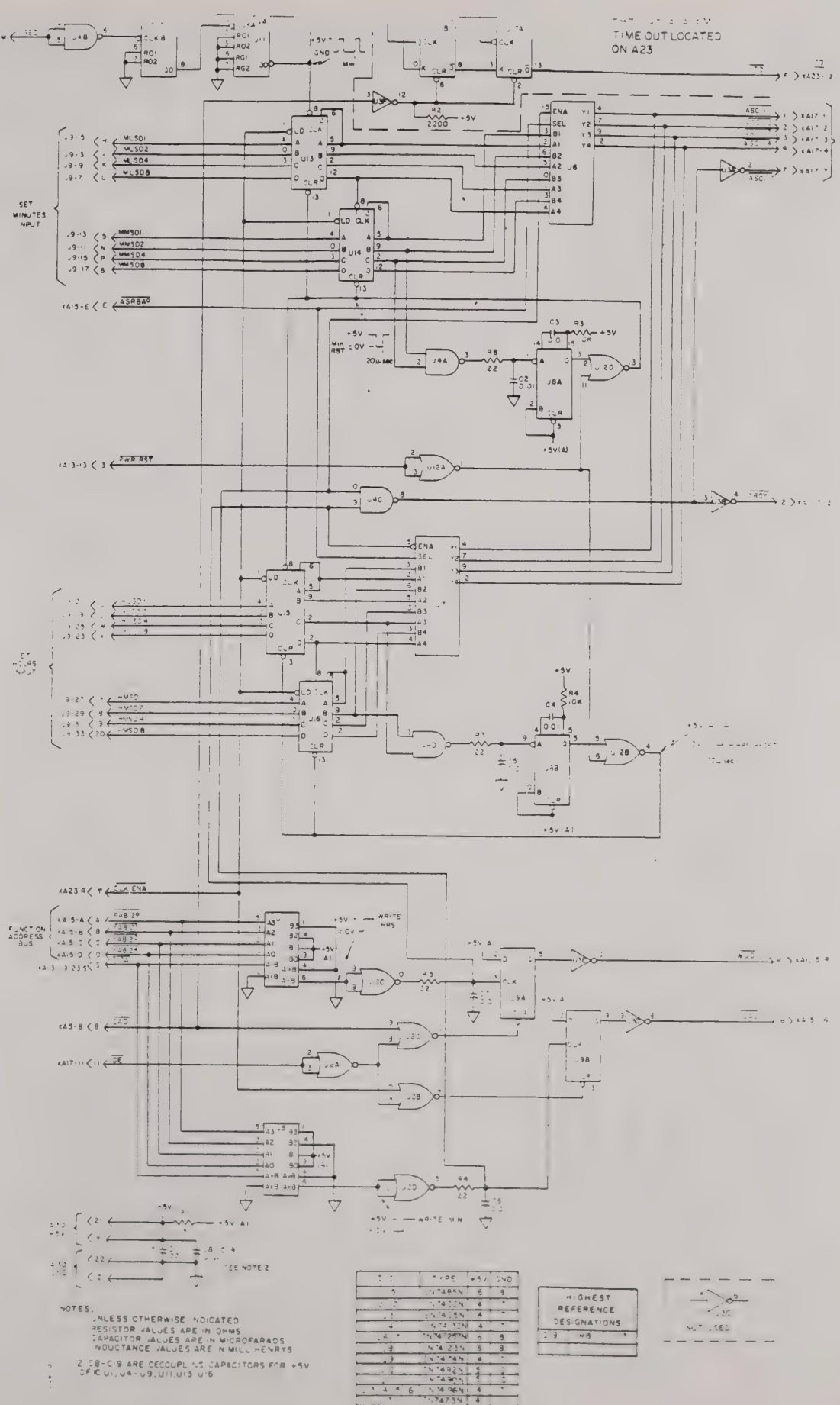
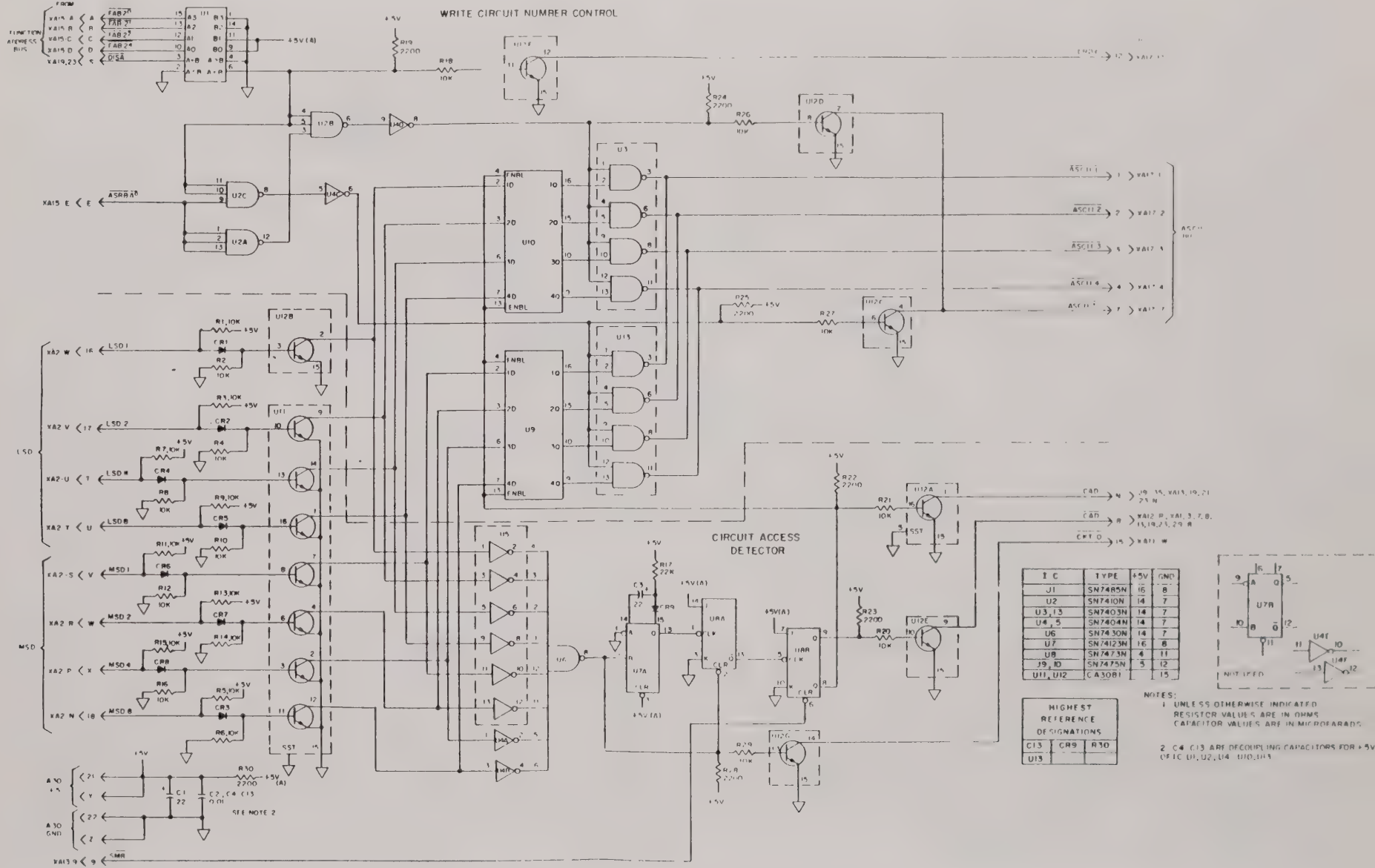


Figure 7 .3 Model 2765 24 Hour Clock.
A1A3. Schematic Diagram



IC	TYPE	+5V	GND
U1	SN7485N	16	8
U2	SN7410N	14	7
U3,13	SN7403N	14	7
U4,5	SN7404N	14	7
U6	SN7430N	14	7
U7	SN74123N	16	8
U8	SN7473N	4	11
J9,10	SN7475N	5	12
U11,U12	CA3081		15

HIGHEST REFERENCE DESIGNATIONS		
C13	CR9	R30
U13		

Figure 7-4 Model 2765, Circuit Access Detector, A1A5, Schematic Diagram

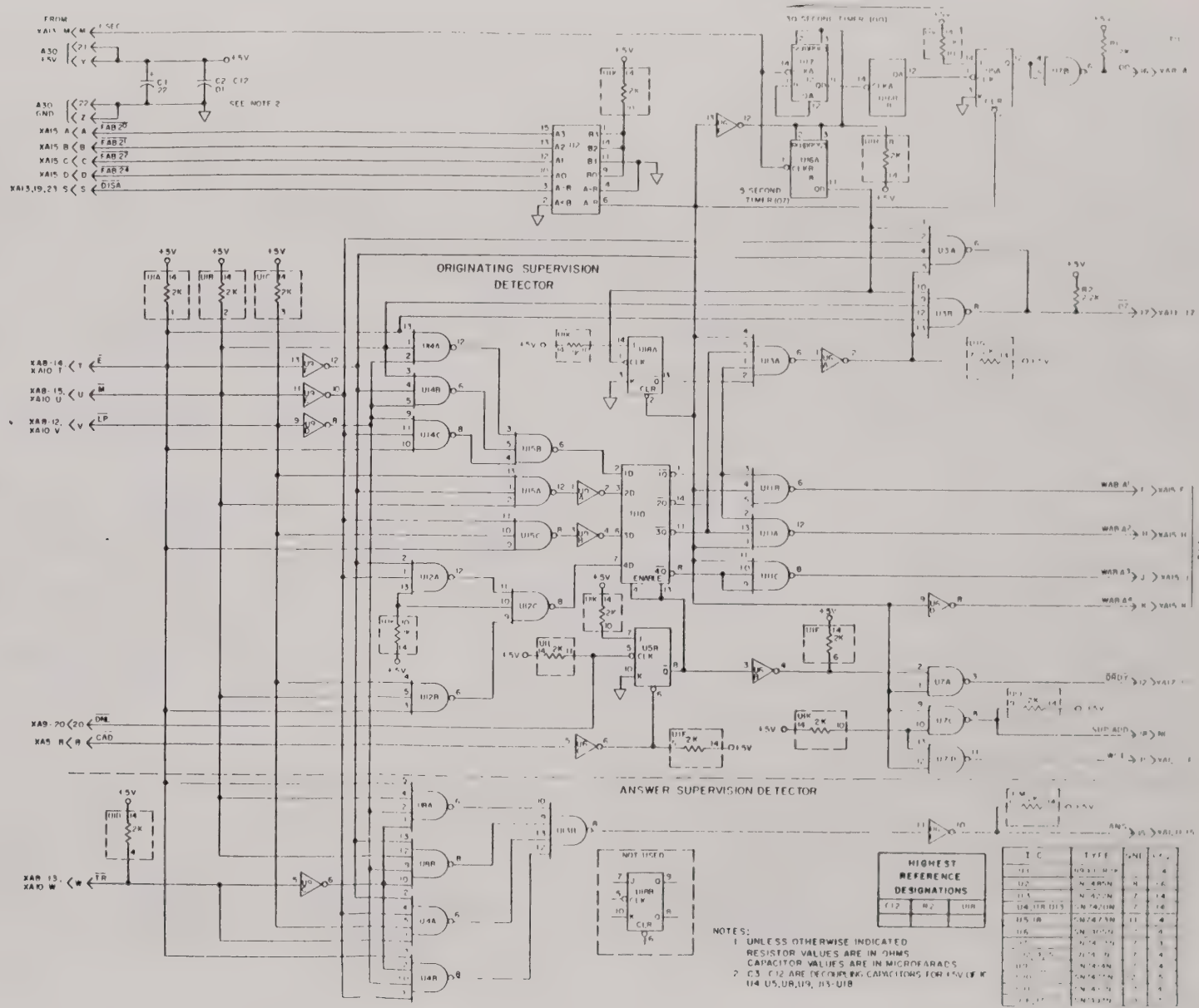

ORIGINATING SUPERVISION DETECTOR
ANSWER SUPERVISION DETECTOR
NOT USED
HIGHEST REFERENCE DESIGNATIONS
NOTES:
1. UNLESS OTHERWISE INDICATED RESISTOR VALUES ARE IN OHMS CAPACITOR VALUES ARE IN MICROFARADS
2. C1, C12 ARE DECOUPLING CAPACITORS FOR +5V (FOR U4, U5, U8, U9, U13-U18)

Figure 7 – 5. Model 2765, Originating Supervision Detector, A1A7, Schematic Diagram

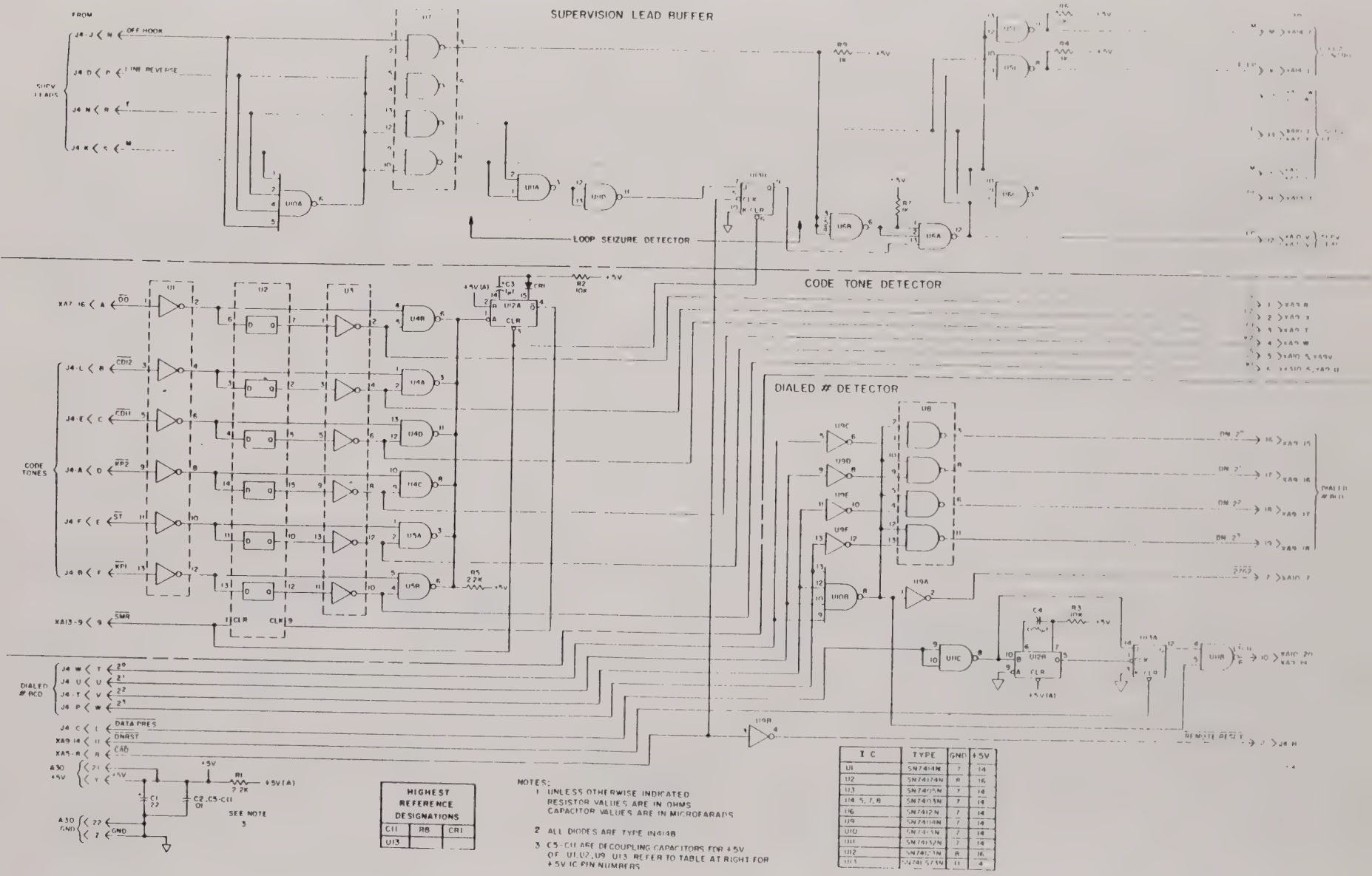


Figure 7 - 6 Model 2765, TTS 2762 Interface, A1A8, Schematic Diagram

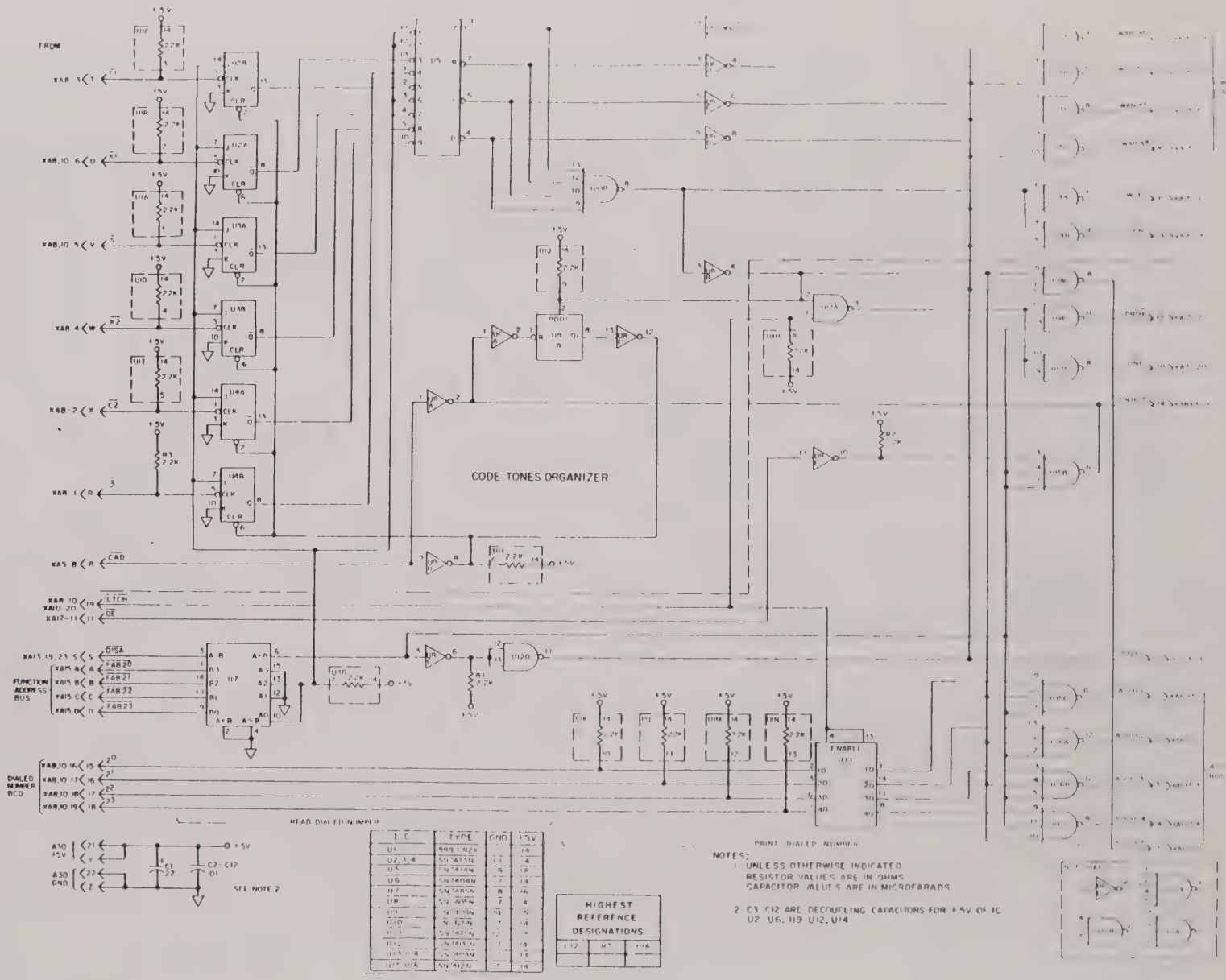


Figure 7 7 Model 2765, Dialed Number Organizer, A1A9, Schematic Diagram

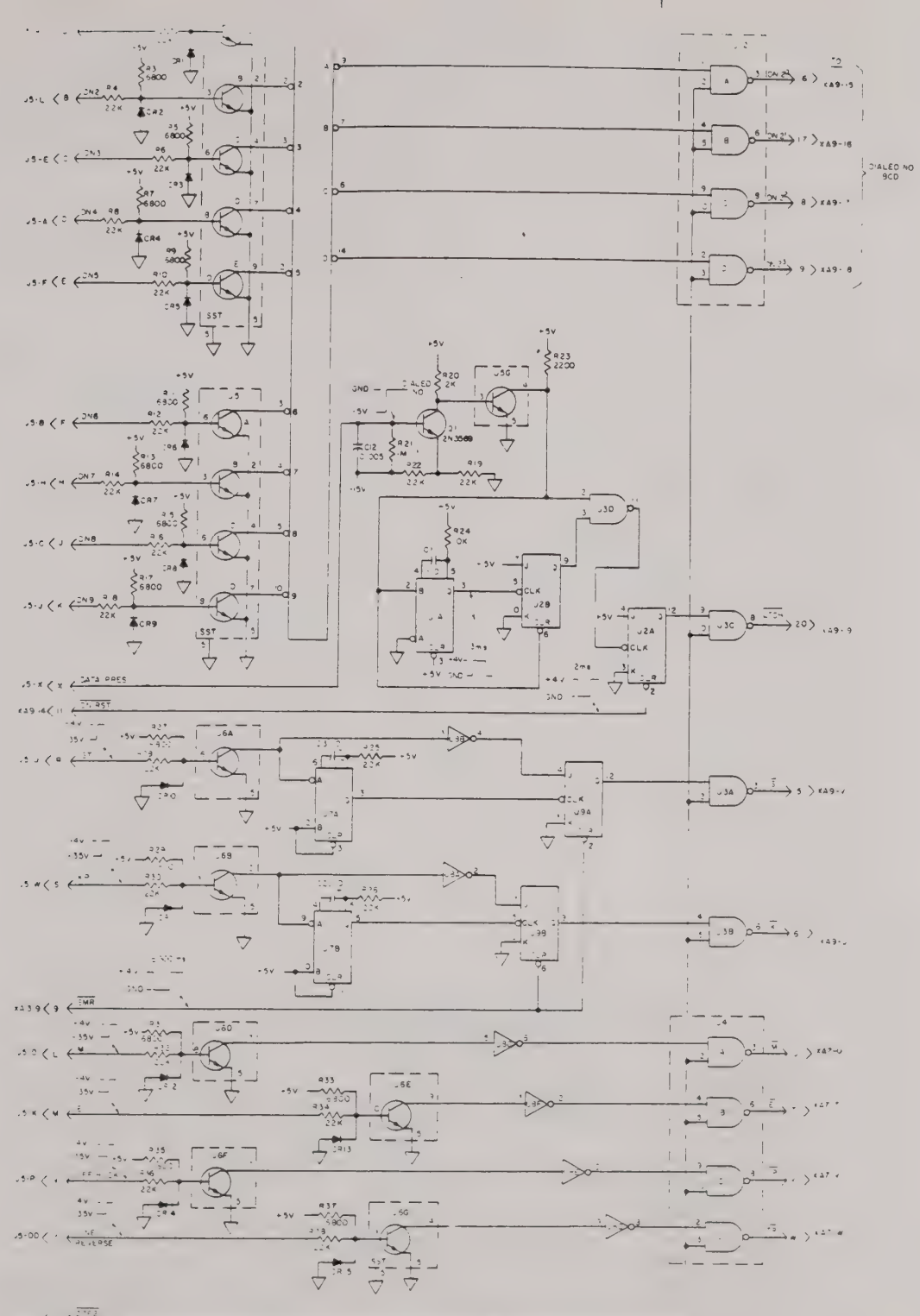


Figure 7-8 Model 2765, TTS 76 Interface, A1A10, Schematic Diagram

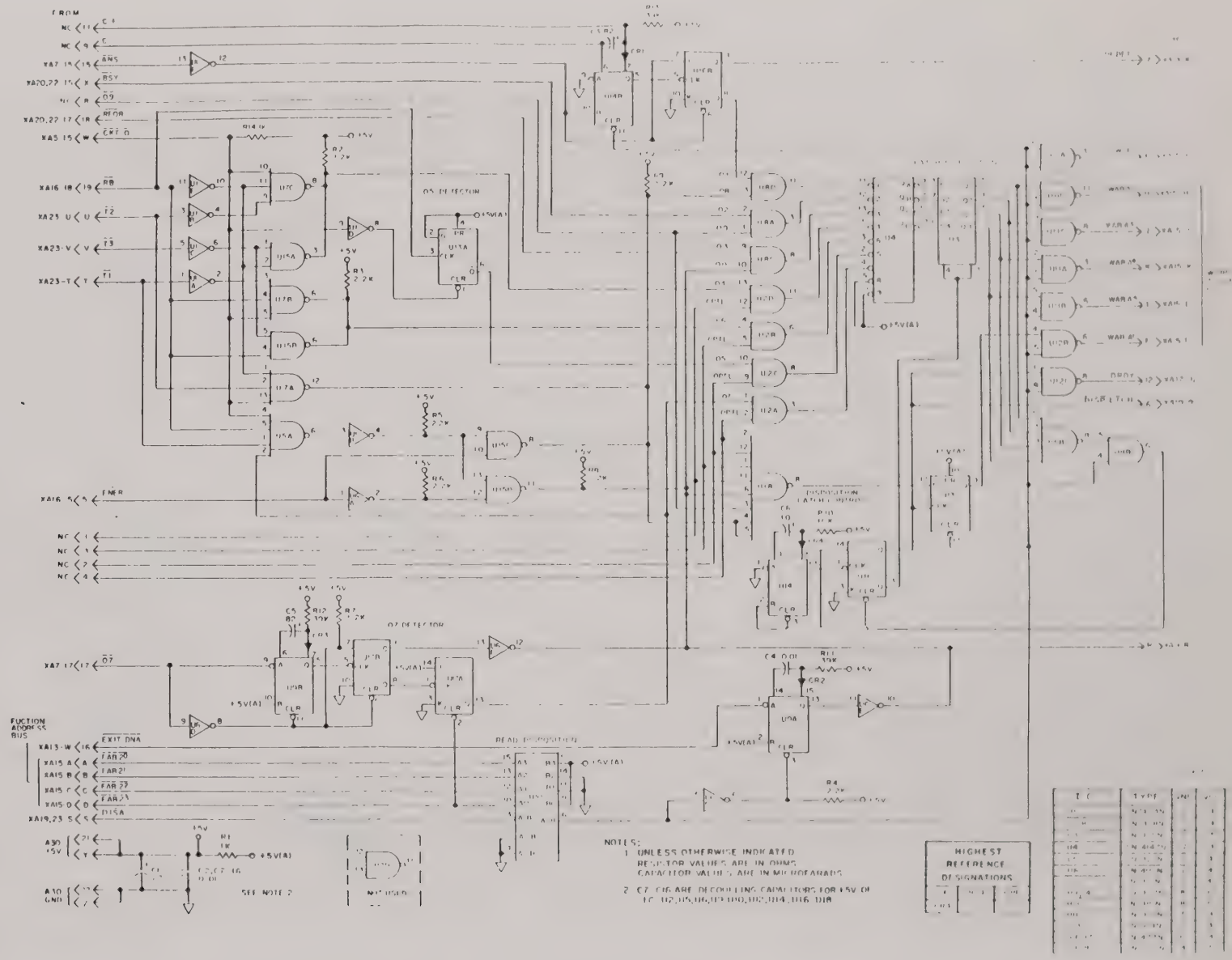


Figure 7 9 Model 2765, Test Results Detector, A1A11, Schematic Diagram.

7 10

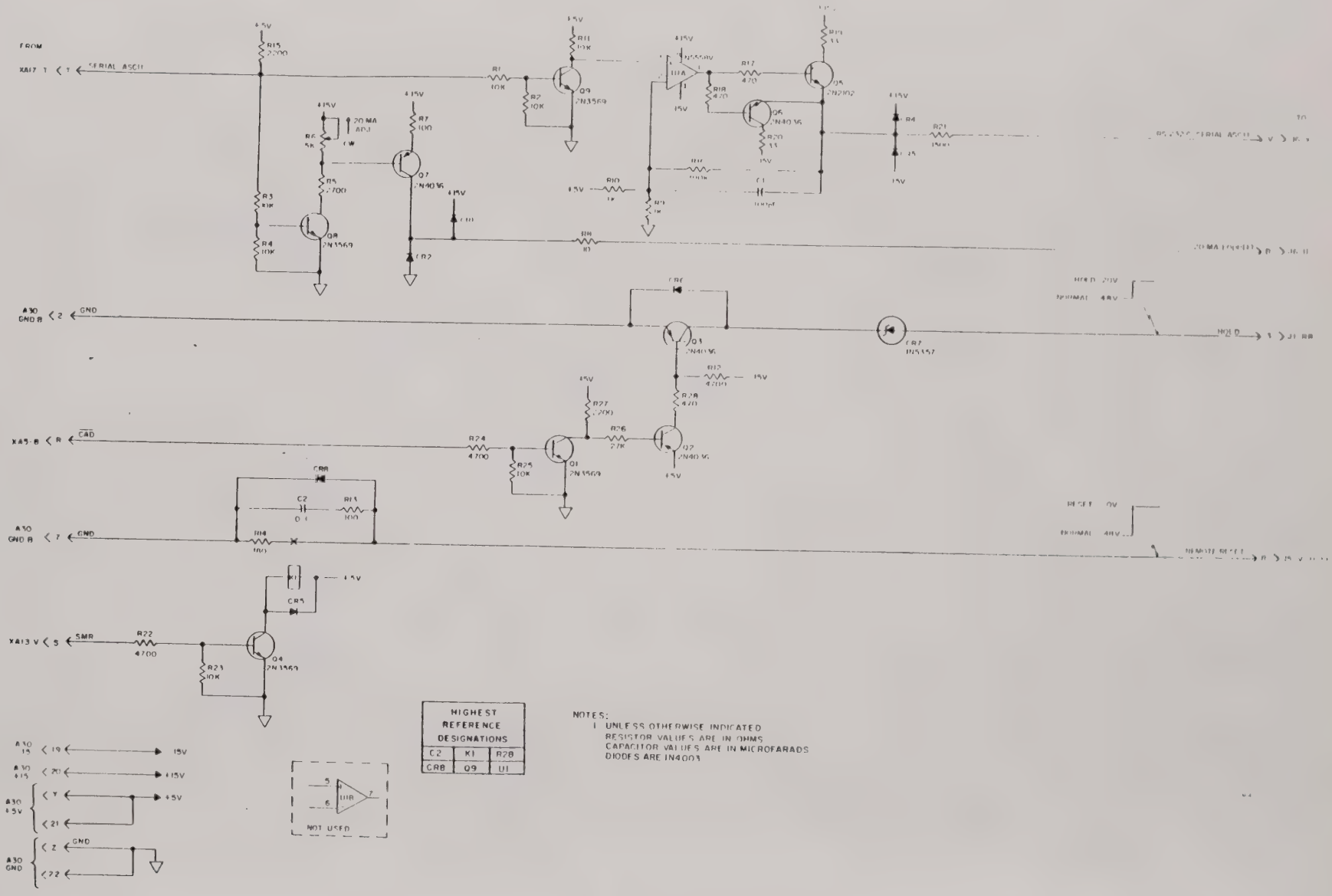
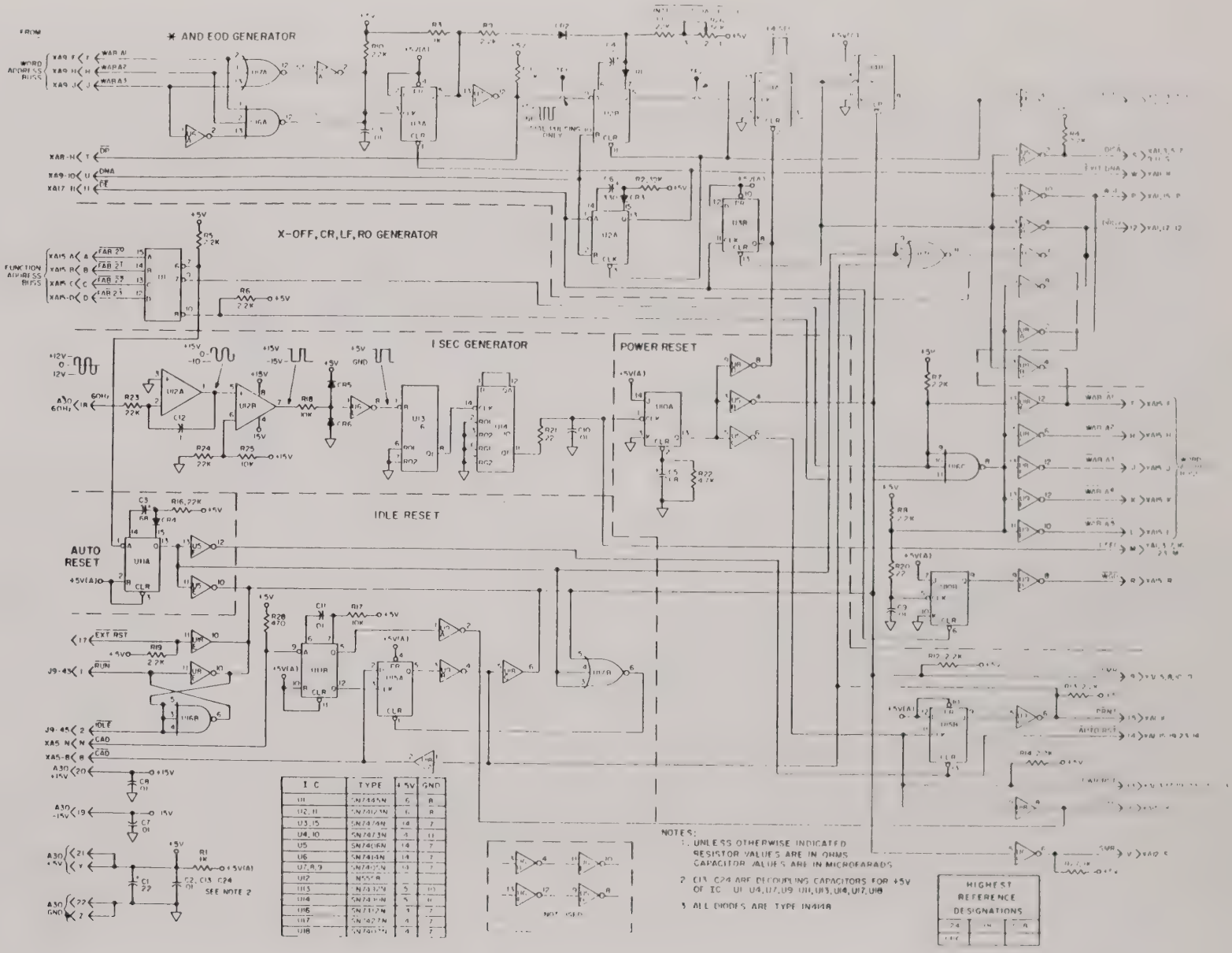


Figure 7 10 Model 2765, Output Buffer, A1A12, Schematic Diagram


* AND EOD GENERATOR
X-OFF, CR, LF, RO GENERATOR
1 SEC GENERATOR
POWER RESET
IDLE RESET
AUTO RESET
NOTES:
1. UNLESS OTHERWISE INDICATED RESISTOR VALUES ARE IN OHMS CAPACITOR VALUES ARE IN MICROFARADS
2 C13, C24 ARE DECOUPLING CAPACITORS FOR +5V OF IC U1, U4, U7, U9, U11, U13, U14, U17, U18
3 ALL DIODES ARE TYPE IN4148
HIGHEST REFERENCE DESIGNATIONS

I C	TYPE	+5V	GND
U1	SN7445N	6	8
U2, 11	SN7812N	6	8
U3, 15	SN7474N	14	7
U4, 10	SN7473N	4	11
U5	SN74C86N	14	7
U6	SN7414N	14	7
U7, 8, 9	SN7420N	14	7
U12	N555A		
U13	N7312N	5	11
U14	SN7400N	5	11
U15	SN7427N	4	7
U17	SN7427N	4	7
U18	SN7401N	4	7

Figure 7 11 Model 2765, Special Function Generator, A1A13, Schematic Diagram

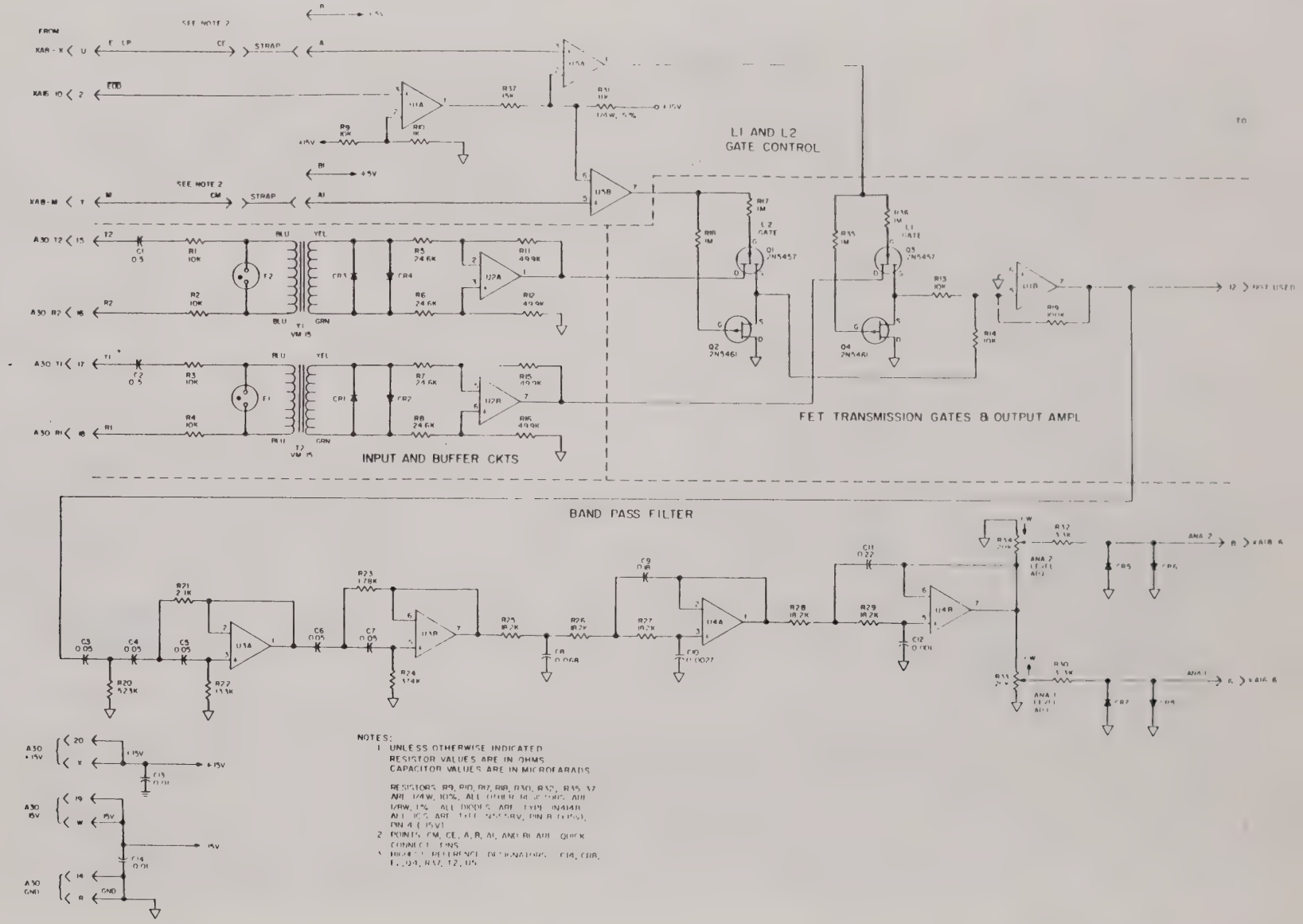

L1 AND L2
GATE CONTROL
FET TRANSMISSION GATES & OUTPUT AMPL
INPUT AND BUFFER CKTS
BAND PASS FILTER
NOTES:
1 UNLESS OTHERWISE INDICATED
RESISTOR VALUES ARE IN OHMS
CAPACITOR VALUES ARE IN MICROFARADS
2 POINTS CM, CE, A, B, A1, AND B1 ARE QUICK CONNECT PINS

Figure 7 12 Model 2765, Tones Filter, A1A14, 7 13
Schematic Diagram

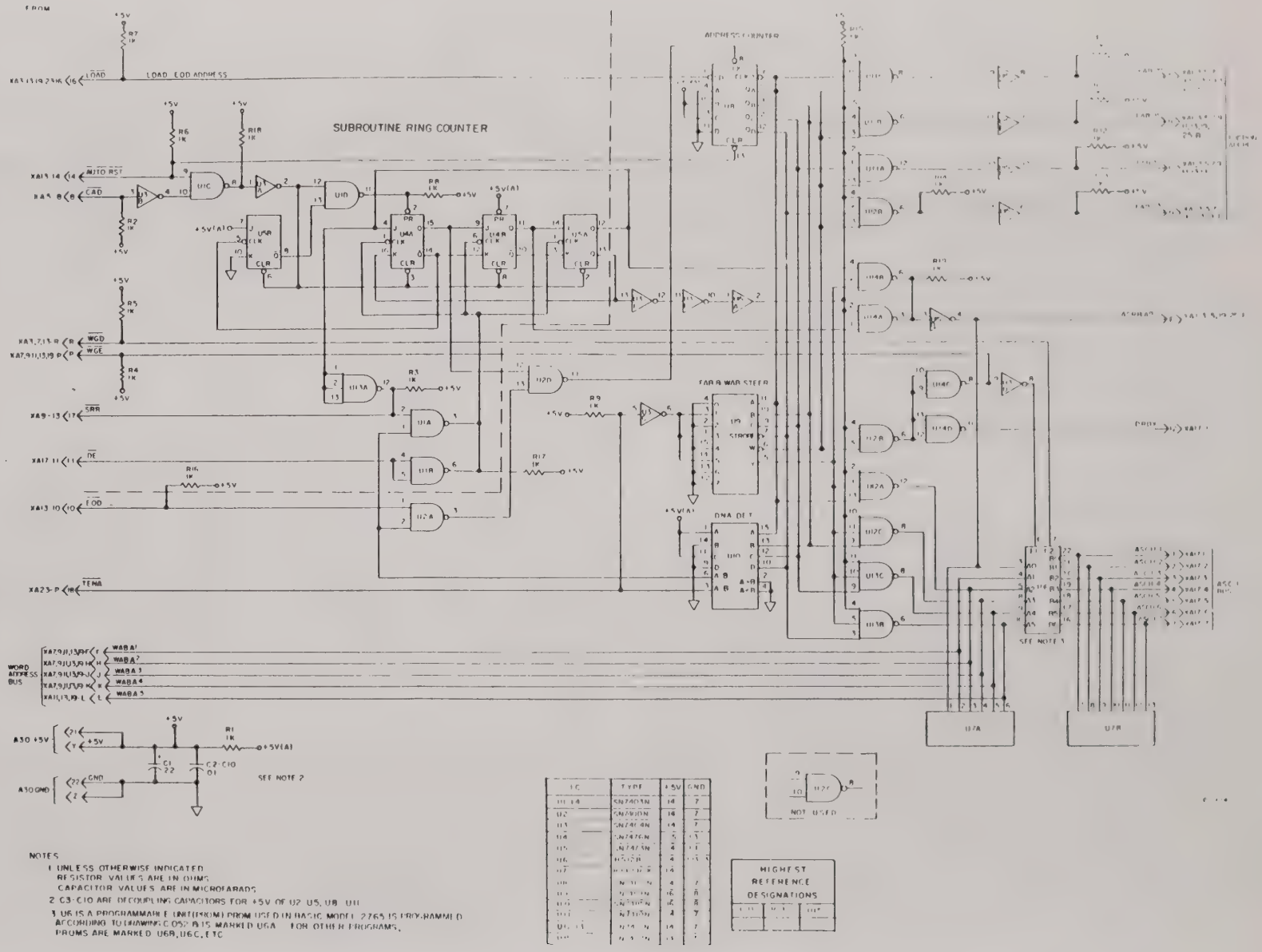


Figure 7 13 Model 2765, Address Control, A1A15, Schematic Diagram

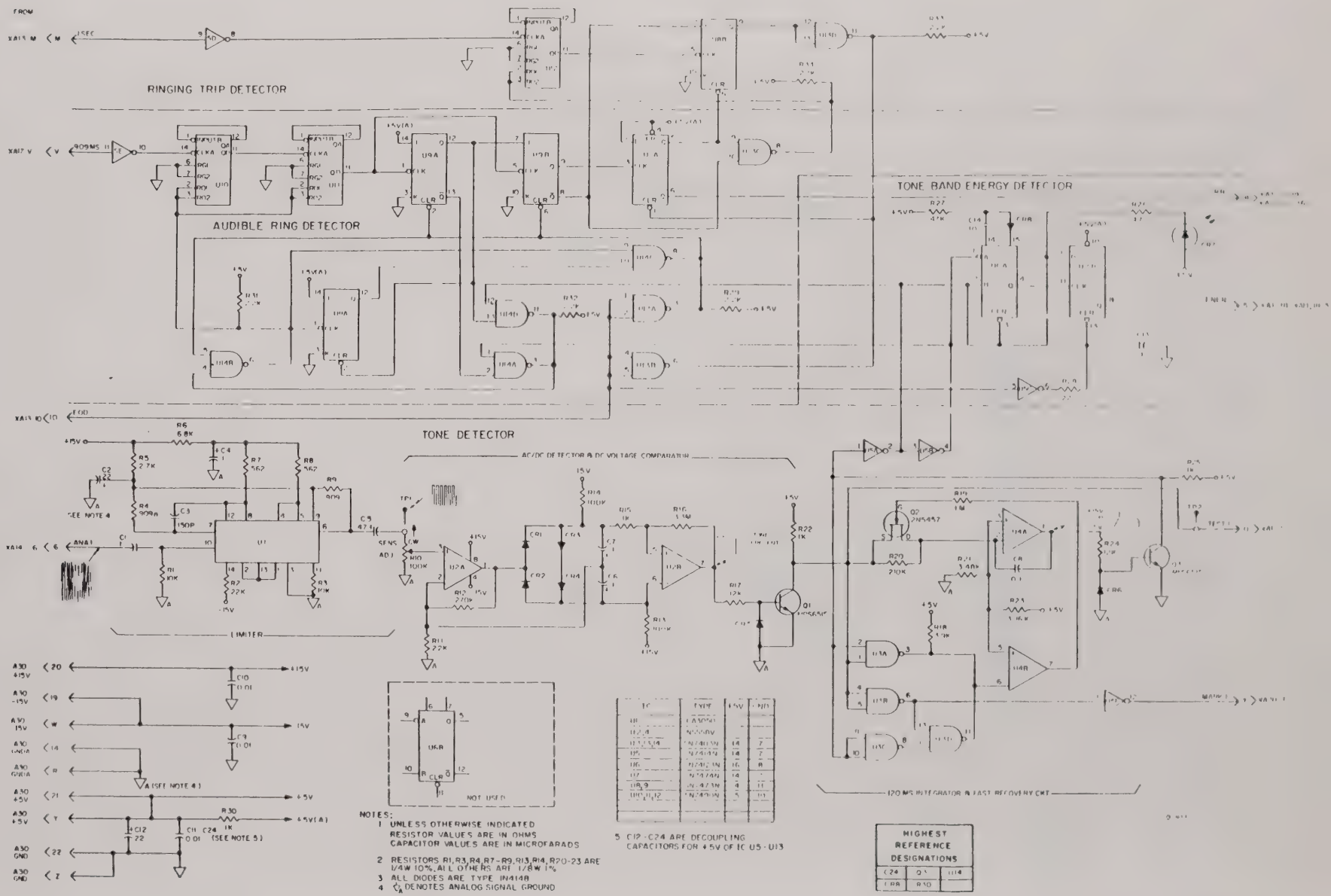

RINGING TRIP DETECTOR
AUDIBLE RING DETECTOR
TONE DETECTOR
TONE BAND ENERGY DETECTOR
LIMITER
AC/DC DETECTOR & DC VOLTAGE COMPARATOR
120 MS INTEGRATOR & FAST RECOVERY CKT
NOT USED
SEE NOTE 4
SENS ADJ
NOTES:
1 UNLESS OTHERWISE INDICATED RESISTOR VALUES ARE IN OHMS CAPACITOR VALUES ARE IN MICROFARADS
2 RESISTORS R1, R3, R4, R7-R9, R13, R14, R20-23 ARE 1/4W 10%, ALL OTHERS ARE 1/8W 1%
3 ALL DIODES ARE TYPE IN4148
4 DENOTES ANALOG SIGNAL GROUND
5 C12-C24 ARE DECOUPLING CAPACITORS FOR +5V OF IC U5-U13
HIGHEST REFERENCE DESIGNATIONS
C24
Q3
U14
R30

Figure 7 14 Model 2765, Tones and Ring Back Detector (Low), A1A16, Schematic Diagram.

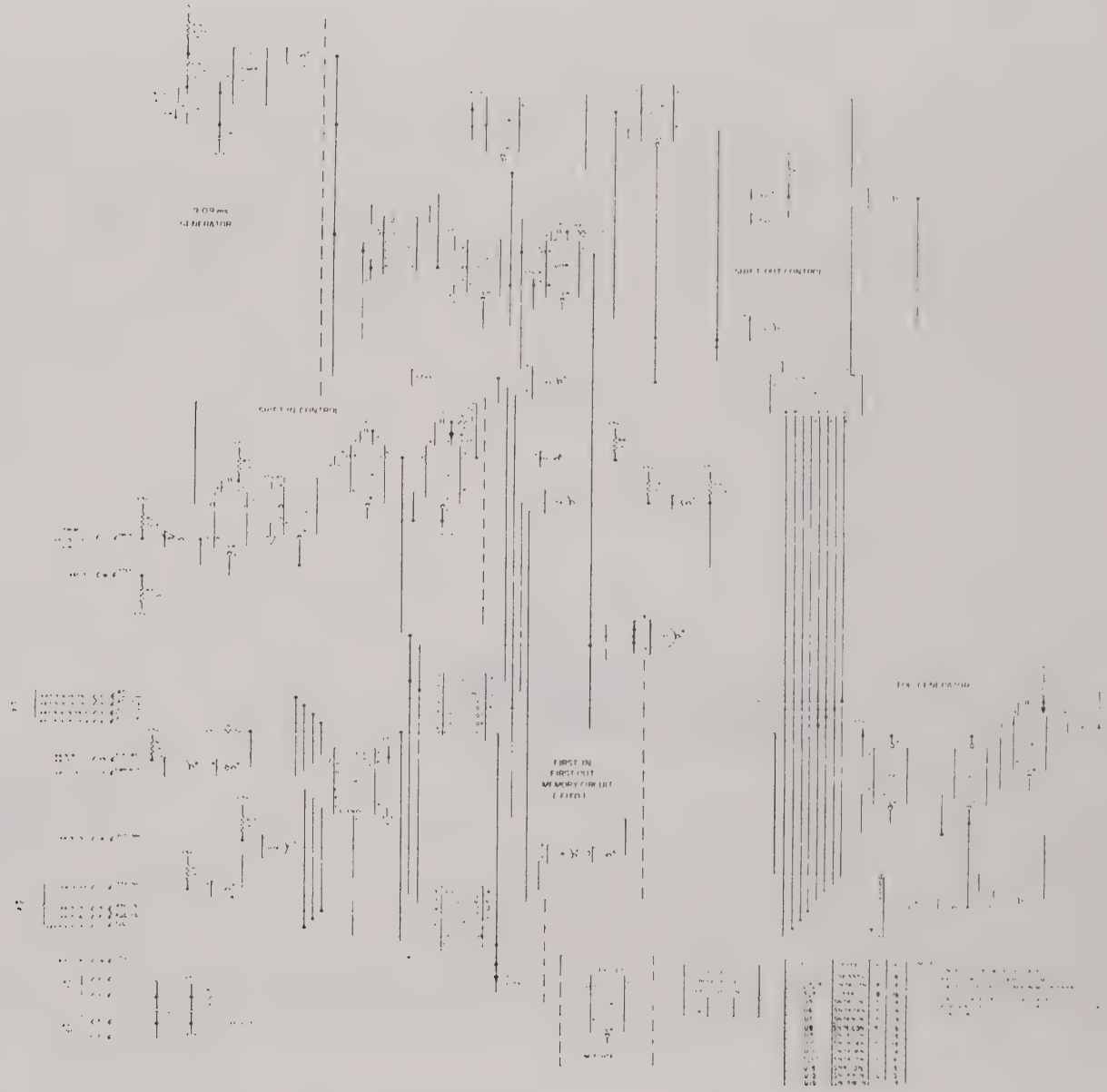
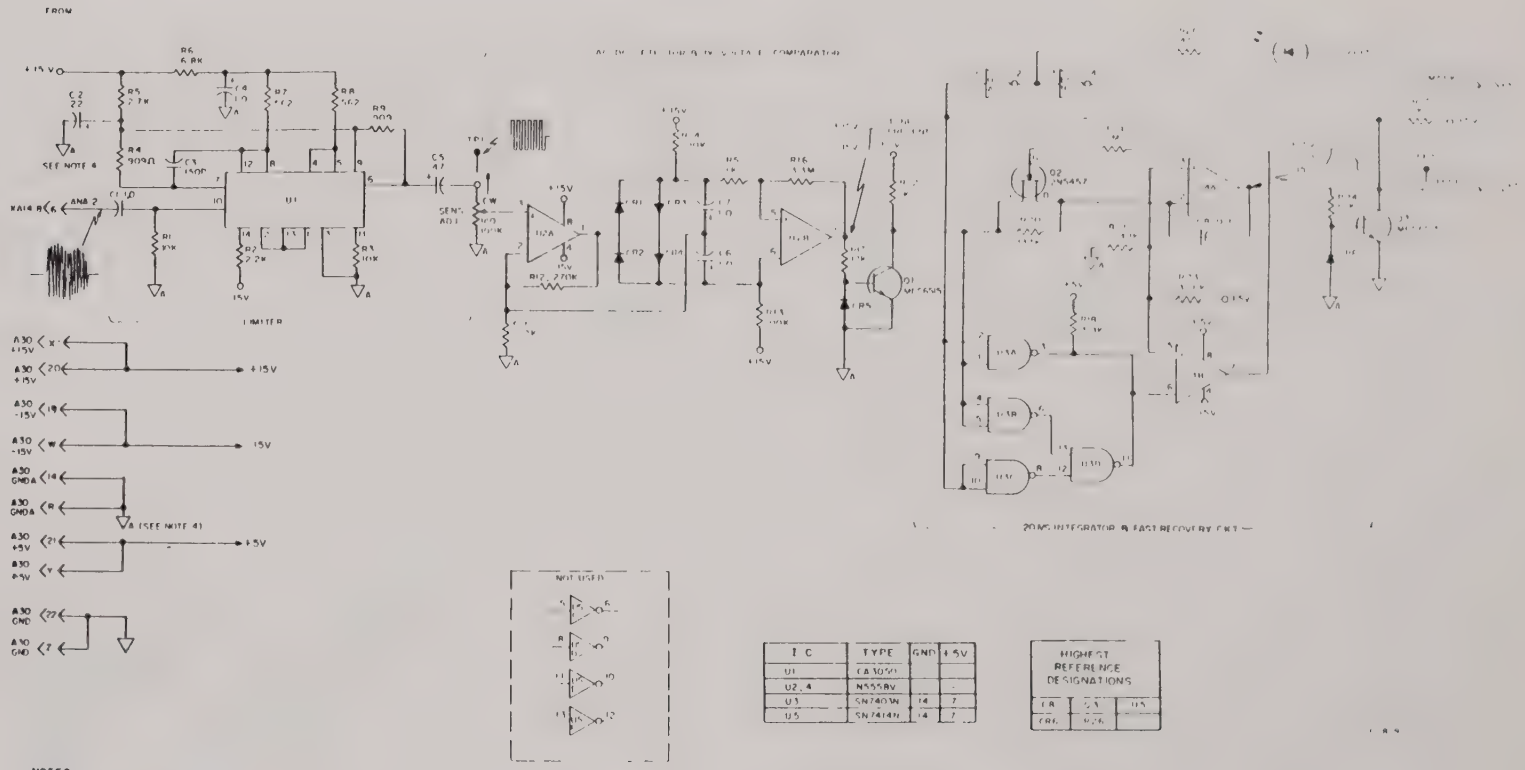


Figure 7 – 15 Model 2765, Data Control, A1A17, Schematic Diagram

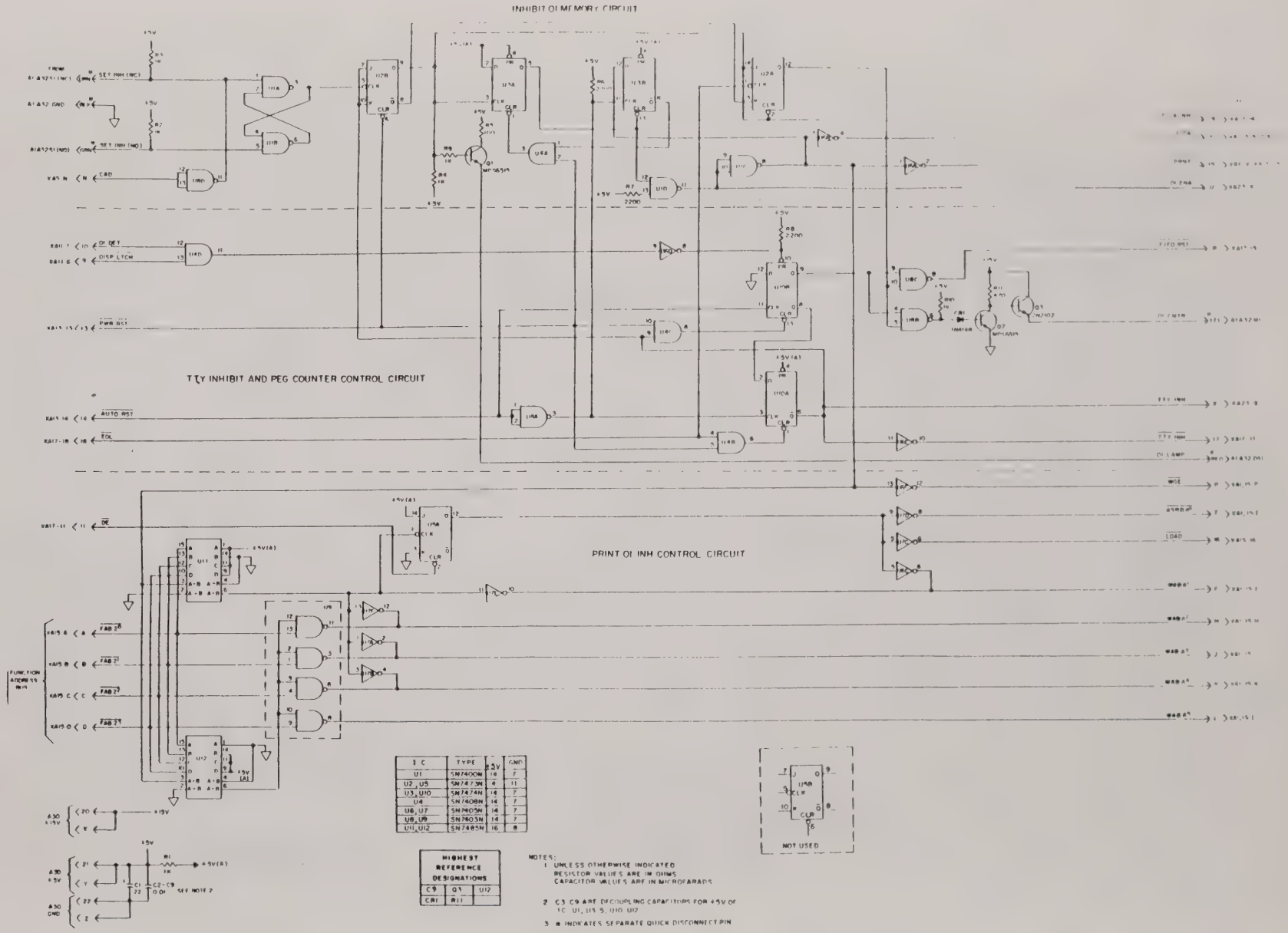


I C	TYPE	GND	+ 5V
U1	CA3050		
U2, 4	N555BV		-
U3	SN7403N	14	7
U5	SN7414N	14	7

HIGHEST REFERENCE DESIGNATIONS		
CR	C1	U5
CR6	Q2	

NOTES:
1. UNLESS OTHERWISE INDICATED
   RESISTOR VALUES ARE IN OHMS
   CAPACITOR VALUES ARE IN MICROFARADS
2. RESISTORS R1, R3, R4, R7, R9, R13, R14, R20-23 ARE 1/4 W 10%, ALL OTHERS ARE 1/8W 1%
3. ALL DIODES ARE TYPE 1N4148
4. ⏚A DENOTES ANALOG SIGNAL GROUND

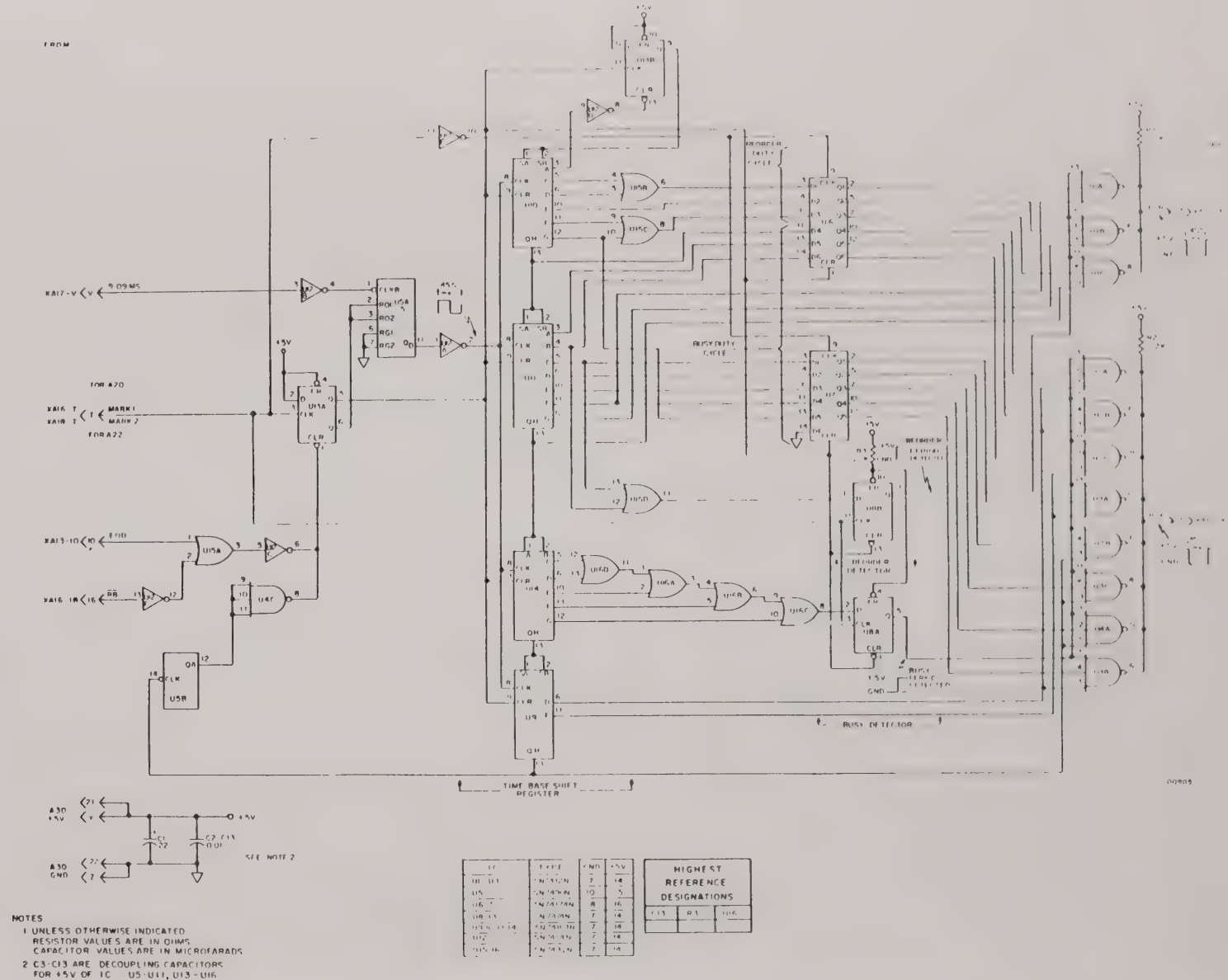
Figure 7 16 Model 2765, Tones Detector (High), A1A18, Schematic Diagram


INHIBIT OI MEMORY CIRCUIT
TTY INHIBIT AND PEG COUNTER CONTROL CIRCUIT
PRINT OI INH CONTROL CIRCUIT
NOT USED
NOTES:
1 UNLESS OTHERWISE INDICATED
RESISTOR VALUES ARE IN OHMS
CAPACITOR VALUES ARE IN MICROFARADS
2 C3 C9 ARE DECOUPLING CAPACITORS FOR +5V OF IC U1, U3 5, U10 U12
3 # INDICATES SEPARATE QUICK DISCONNECT PIN

I C	TYPE	+5V	GND
U1	SN7400N	14	7
U2, U5	SN7473N	4	11
U3, U10	SN7474N	14	7
U4	SN7408N	14	7
U6, U7	SN7405N	14	7
U8, U9	SN7803N	14	7
U11, U12	SN7485N	16	8

HIGHEST REFERENCE DESIGNATIONS		
C9	Q3	U12
CR1	R11	

Figure 7 17 Model 2765, Call Inhibit Control A1A19, Schematic Diagram



NOTES

1 UNLESS OTHERWISE INDICATED:
RESISTOR VALUES ARE IN OHMS
CAPACITOR VALUES ARE IN MICROFARADS

2 C3-C13 ARE DECOUPLING CAPACITORS FOR +5V OF IC U5-U11, U13-U16

Figure 7 18 Model 2765, Digital Timer, A1A20 and A22, Schematic Diagram

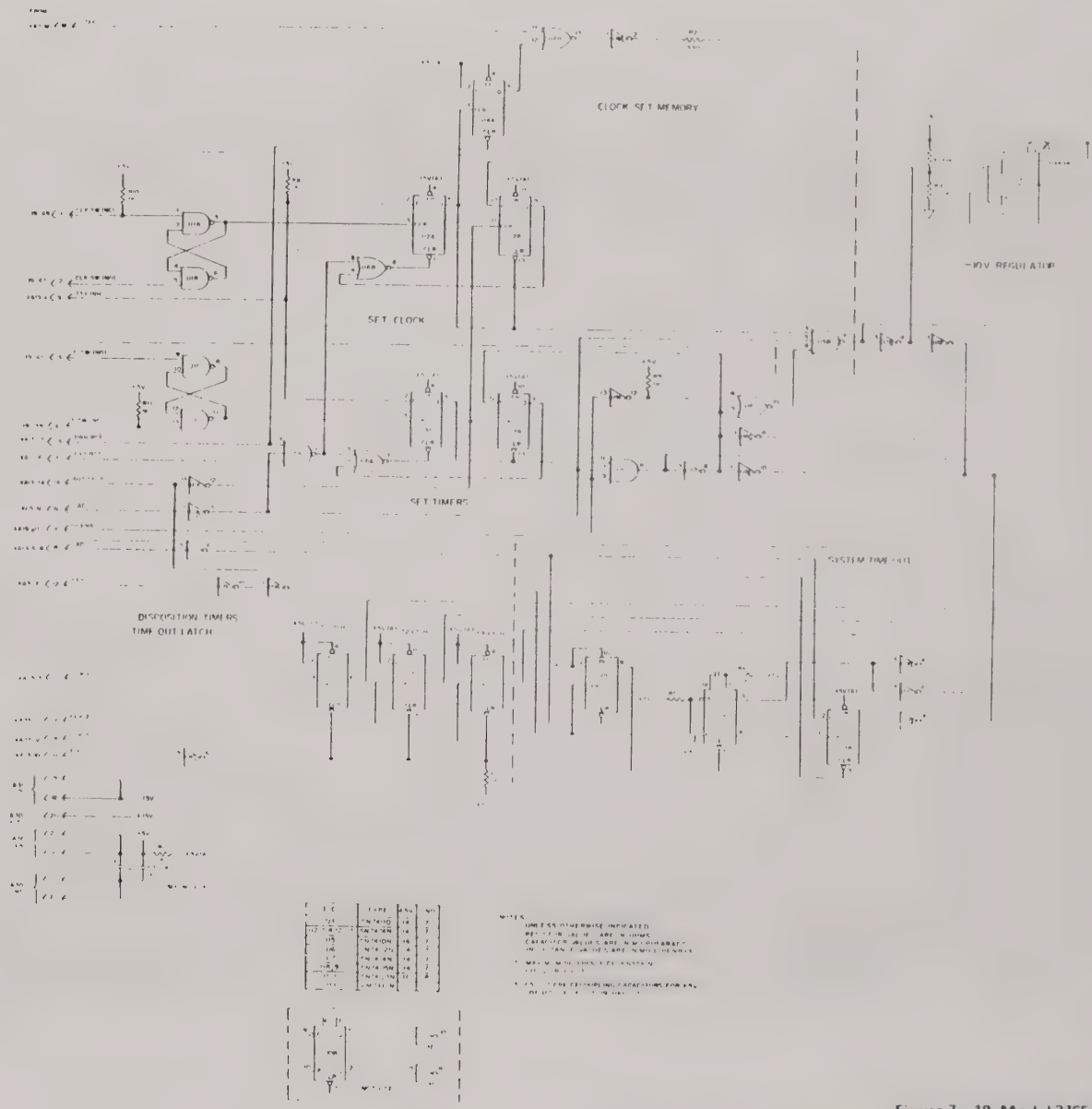
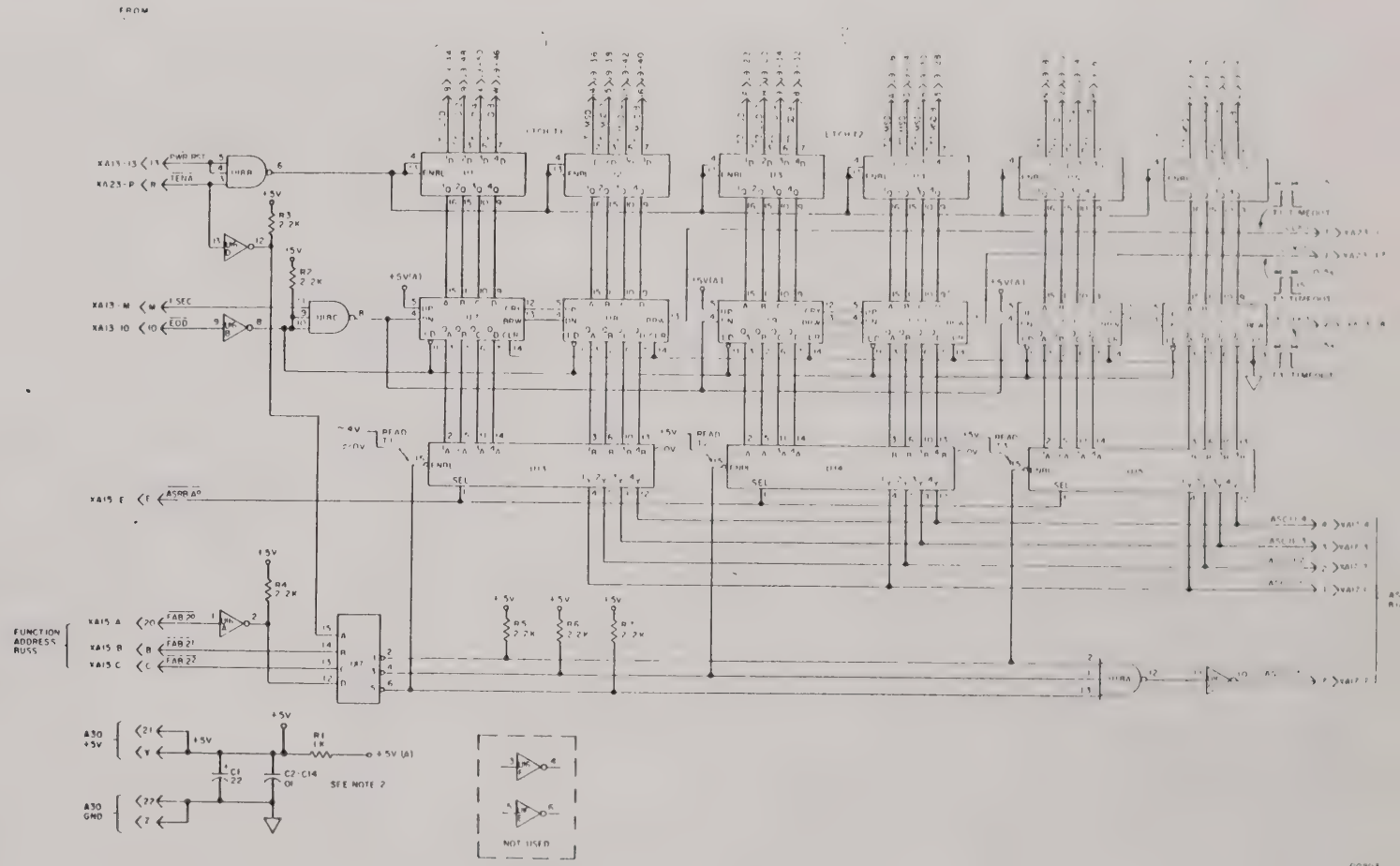


Figure 7 19 Model 2765, Print Control, A1A23, Schematic Diagram



NOTES

1 UNLESS OTHERWISE INDICATED
RESISTOR VALUES IN OHMS
CAPACITOR VALUES ARE IN MICROFARADS

2 C3-C14 ARE DECOUPLING CAPACITORS
FOR +5V OF IC U1, U3 U5, U7-U9, U12-U16

HIGHEST REFERENCE DESIGNATIONS		
	R7	

IC	TYPE		
U1-6	SN74155N	5	8
U7-12	SN74157	16	8
U13-15	SN74175N	16	8
U16	SN74161N	16	7
U17	SN74157N	16	8
V R	SN74107N	14	7

Figure 7 20 Model 2765 Disposition Timers
A1A25, Schematic Diagram

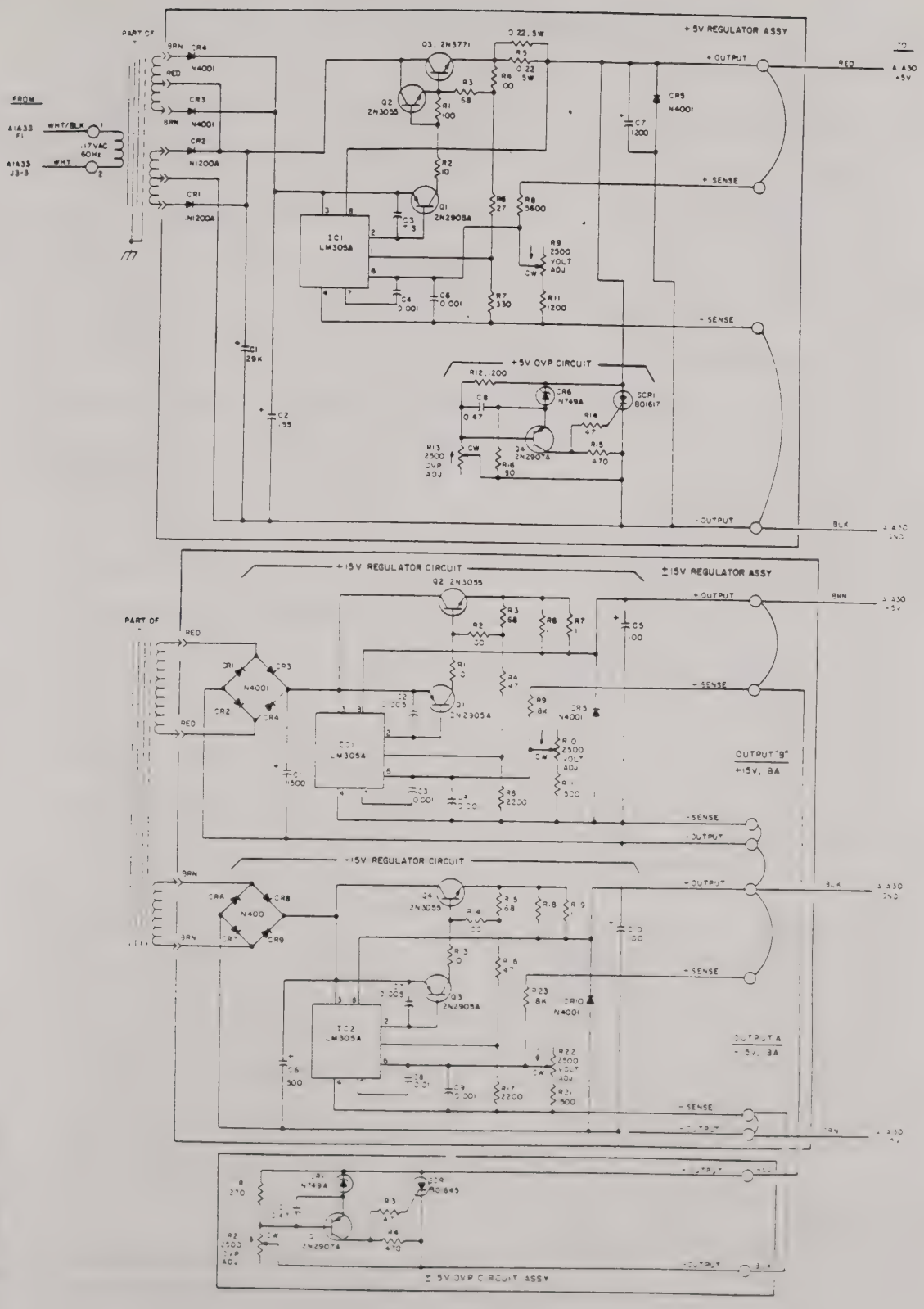


Figure 7 - 21 Model 2765, Xentek Power Supply Assembly Model 2718 Schematic Diagram

MODEL 2765 ERRATA

4–2–75

1. This errata applies to Model 2765 units with serial number 165 and above. It incorporates changes listed in Northeast Electronics change orders six through nine.

2. In Section 2, Table 2–1, perform the following:

a. On page 2–1, Disposition, 00 No Decision, change paragraph, a, to read:

Energy detected after EOD* Pattern ≠ busy, reorder, or ring.

Calling party disconnects or time T3* * elapses.

b. On page 2–1, Disposition, 02 Busy, change specification to read as follows:

60 IPM Busy detected after EOD.

No audible ring detected.

No answer supervision detected.

Calling party disconnects or time T3* * elapses

c. On page 2–1, Disposition, 03 Reorder, change specification to read as follows:

No audible ring detected.

No answer supervision detected.

Calling party disconnects or time T3* * elapses.

d. On page 2–1 and 2–2, Disposition, 06 No Ring No Answer, paragraph a and b, change to read as follows

a. Calling party disconnect between T1 and T3

No tone-band energy detected.

No answer supervision

NOTE

Tone-band energy is any voice, noise, or tone signals detectable by Model 2765 tone filters.

b. Calling party holds to time T3* *

No tone-band energy detected.

No answer supervision.

e. On page 2–2, Disposition 09, Computer Answer (Option), change specification to read as follows:

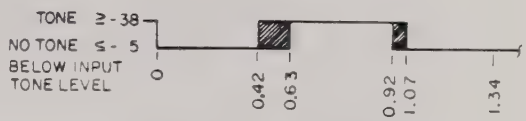
2125 Hz detected between:

EOD and ans. supv. plus 4 seconds,

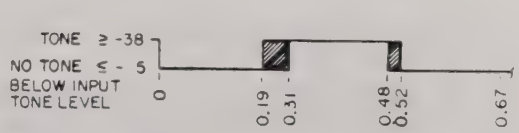
EOD and T3, or

EOD and calling party disconnect

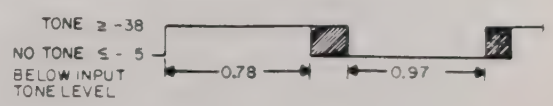
f. On page 2–3, Tone Detection-Specific, Busy Level and Timing specification, replace with diagram below:



g. On page 2–3, Tone Detection-Specific, Reorder Level and Timing specification, replace with diagram below:



h. On page 2–3, Tone Detection-Specific, Audible Ringing Level and Timing specification, replace with diagram below



CC840

i. On page 2 – 3, Tone Detection-Specific, 2125 HZ specification, add

Line Selection

4W	Receive Pair
2W	N.A.

j. On page 2 – 4, Voltage Output (RS-232-C), add

Request to Send (pin 4),

connected to pin 20

3. In Section 3, perform the following

a. On page 3 – 2, Figure 3 – 2, Model 2765, TTY Interconnection Cable (W1), replace with Figure 3 – 2 in this errata.

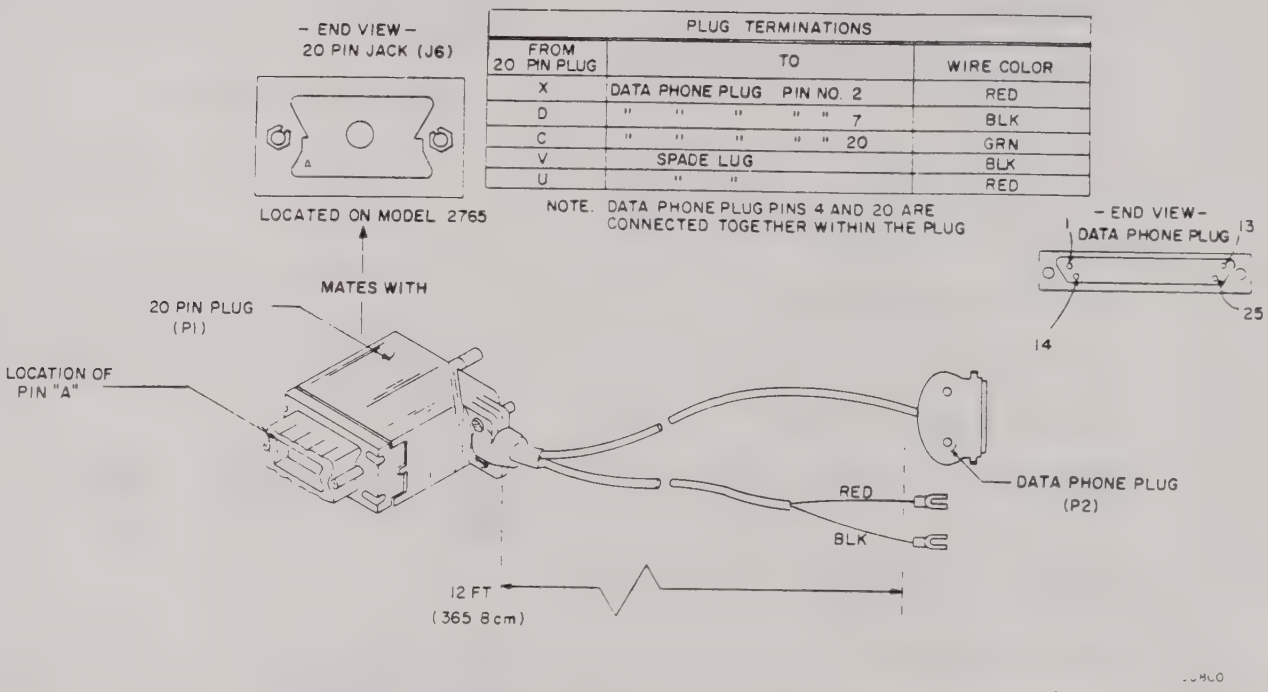


Figure 3 – 2. Model 2765, TTY Interconnection Cable (W1).

b. On page 3 – 7, add to NOTE, a, as follows:

When Model 2765 is used to monitor two-wire circuits with E&M supervision, special connections must be made on Model 2776. Refer to CDA System manual for complete system installation instructions.

c. On page 3 – 9, Figure 3 – 8, Model 2765, Installation Diagram for Connection with Model 2776, replace with Figure 3 – 8 in this errata

i. On page 3 – 13, Figure 3 – 13, Model 2765, 06 NO Ring NO Answer, Disposition Conditions diagram, replace with Figure 3 – 13 in this errata

[illegible] and

1. Neither audible ringing tone nor tone-band energy detected and calling party disconnects after time T1, or

2. Neither audible ringing tone nor tone band energy detected and time T3 elapses without answer supervision

f. On page 3 – 17 and 3 – 18, Table 3 – 4, change the following

1 00 Printout Interpretation to read

No Decision 120 ms tone-band energy detected, but unable to recognize as valid disposition and calling party disconnects, or T3 times out

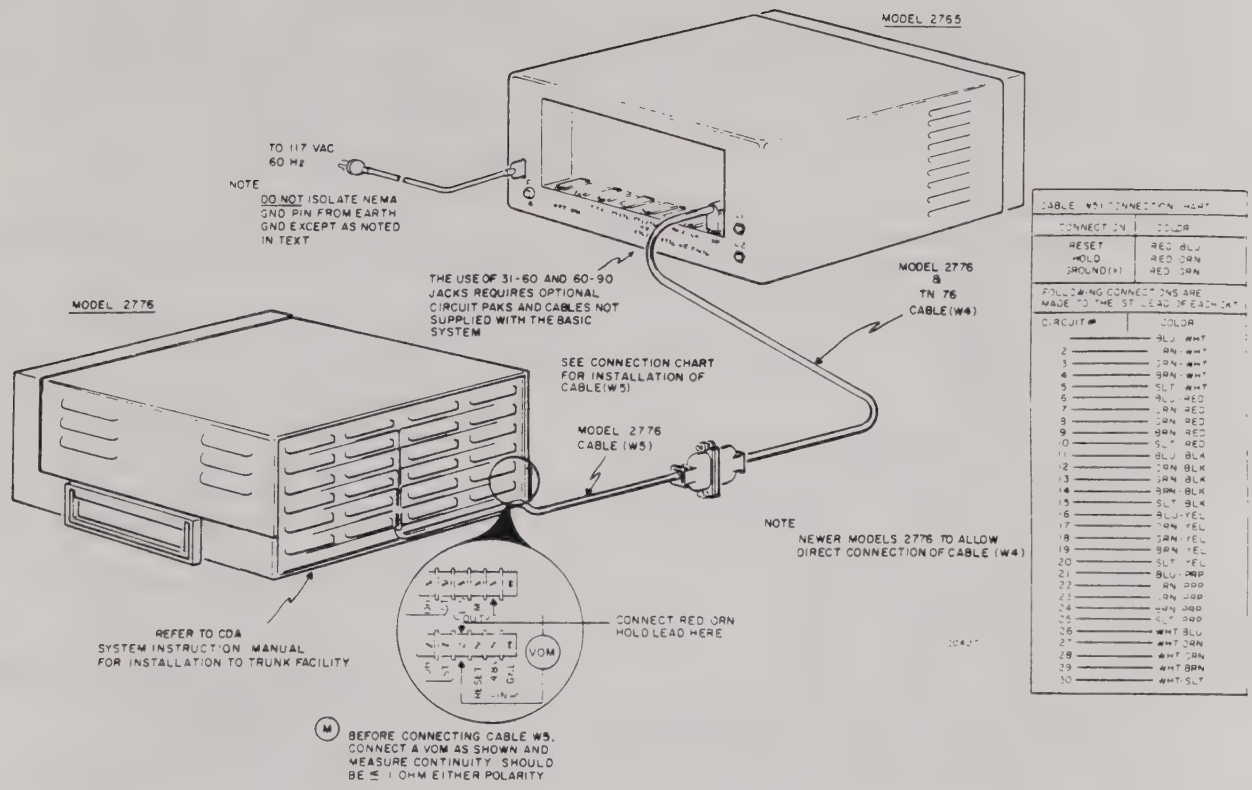


Figure 3—8. Model 2765, Installation Diagram for Connetion with Model 2776.

2. Printout Interpretation to read:

Busy Call: Detected busy tone such as 480 Hz plus 520 Hz at 60 IPM (Refer to Section 2 for busy detection) Also no audible ring or answer supervision detected and calling party disconnects, or T3 times out.

3. 03 Printout Interpretation to read:

Reorder Detected reorder tone such as 480 Hz plus 620 Hz at 120 IPM (Refer to Section 2 for reorder detection conditions). Also no audible ring or answer supervision detection and calling party disconnects, or T3 times out.

4 05 Printout Interpretation to read

No Answer Supervision Audible ring detected, ringing stopped for 7 to 8 seconds with tone band energy detected and no answer supervision

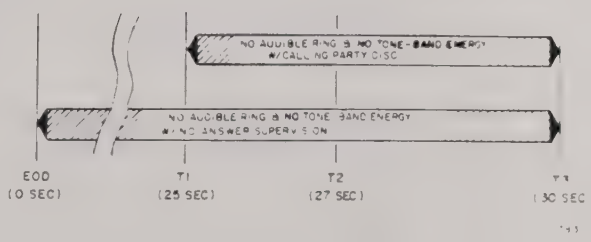

NO AUDIBLE RING & NO TONE-BAND ENERGY W/CALLING PARTY DISC
NO AUDIBLE RING & NO TONE BAND ENERGY W/NO ANSWER SUPERVISION
EOD (0 SEC)
T1 (25 SEC)
T2 (27 SEC)
T3 (30 SEC

Figure 3—13. Model 2765, 06 No Ring, No Answer, Disposition Conditions.

5. 06 Printout Interpretation to read:

No Ring, No Answer: No tone-band energy or answer supervision detected and calling party disconnects after time T1, or T3 times out.

6. 09 Printout Interpretation to read:

• Computer Answered: Detection of a continuous echo suppressor 2150 Hz disabling tone equal to, or greater than 1 second between EOD and T3, or EOD and 4 seconds after answer supervision.

7. 10 Printout Interpretation to read:

• Blue Box: Detection of a continuous 2600 Hz tone equal to, or greater than 150 ms between EOD and T3, or EOD and 4 seconds after answer supervision.

4 In Section 4, perform the following:

a. On page 4 – 2, change paragraph 4.12 to read:

4.12 Printed circuit boards A1A14 and A16 process analog signals on telephone transmission lines being observed via inputs L1 and L2 (A1A33J1 and J2 respectively). Digital Timers pcb A1A20 detects a busy reorder disposition for high or low level supervisory tones appearing on L1 and L2 inputs. Print Control pcb A1A23 and Disposition Timers pcb A1A25 control the disposition timers T1,T2, and T3. Pcb A1A23 also controls printout of time and the timers, when they are set from front panel controls. The 01 inhibit control, pcb A1A19, serves to interface the inhibit controls and counter of the 01 INHIBIT module with other circuitry in the Model 2765.

b. On page 4 – 3, Figure 4 – 2, Model 2765 Overall Block Diagram is superceded by Figure 4 – 2 in this errata

c. On page 4 – 12, Figure 4 – 11, Model 2765, Block Diagram of Address Six Disposition Data Processing is superceded by Figure 4 – 11 in this errata

d. On page 4 – 13, change paragraph 4.66, a and d to read

a Allows L1 and L2 gate control circuitry on Tone Filter pcb A1A14 to detect a HI on M or E-LP inputs. In this case M input is HI. This allows supervisory tones appearing on L2 input to be processed through pcb A1A14 and routed to pcb A1A16

d. Enables digital timers on digital Timer pcb A1A20 to detect a busy ($\overline{BSY}$) or reorder ($\overline{REOR}$).

5. In Section 5, perform the following:

a. On page 5 – 4, Table 5 – 1, change Reference Designator S5 Function to read:

Selects which tone detector the MARK pushbutton is simulating. TEST 1 is selected when an audible ring, energy, busy, or reorder is to be simulated out of the tones detector on pcb A1A16. In Model 2765 units with serial numbers below 165, TEST II is selected when a busy or reorder is to be simulated out of the high-level tones detector on pcb A1A18

b. On page 5 – 16, change paragraphs 5.96 and 5.97 to read:

5.96 **TONES AND RINGBACK DETECTOR PCB A1A16. (9701-96506).**

5.97 To calibrate Tone Detector on pcb A1A16, proceed as follows:

a. Set Model 2765 POWER switch to OFF position and remove pcb A1A16.

b. Insert pcb A1A16 into extender then insert into card cage slot 16.

c. Set POWER switch to ON position

d. Remove all patch cords from signal display unit used in the CDA System.

e. Set up signal display unit to monitor MF signaling on E and M supervised trunks.

f. Insert a 310 patch cord into LINE or E jack of signal display unit and connect a lead from ground to tip on other end of 310 patch cord Supervision indicator E should light on signal unit

g. Connect a lead from ground to pin 10 of pcb A1A16

h Remove patch cord from Model 2765 L1 jack

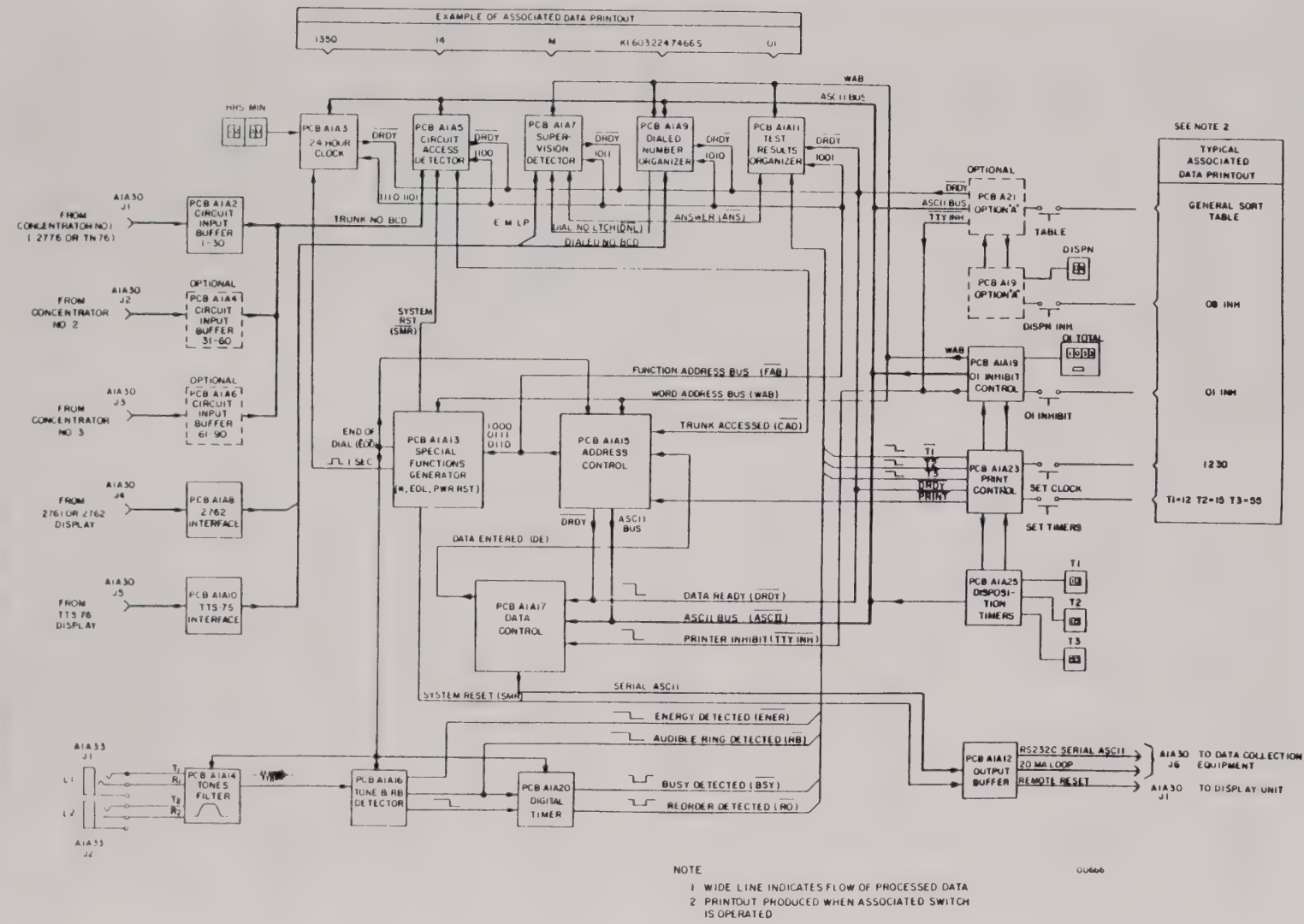


Figure 4—2. Model 2765, Overall Block Diagram.

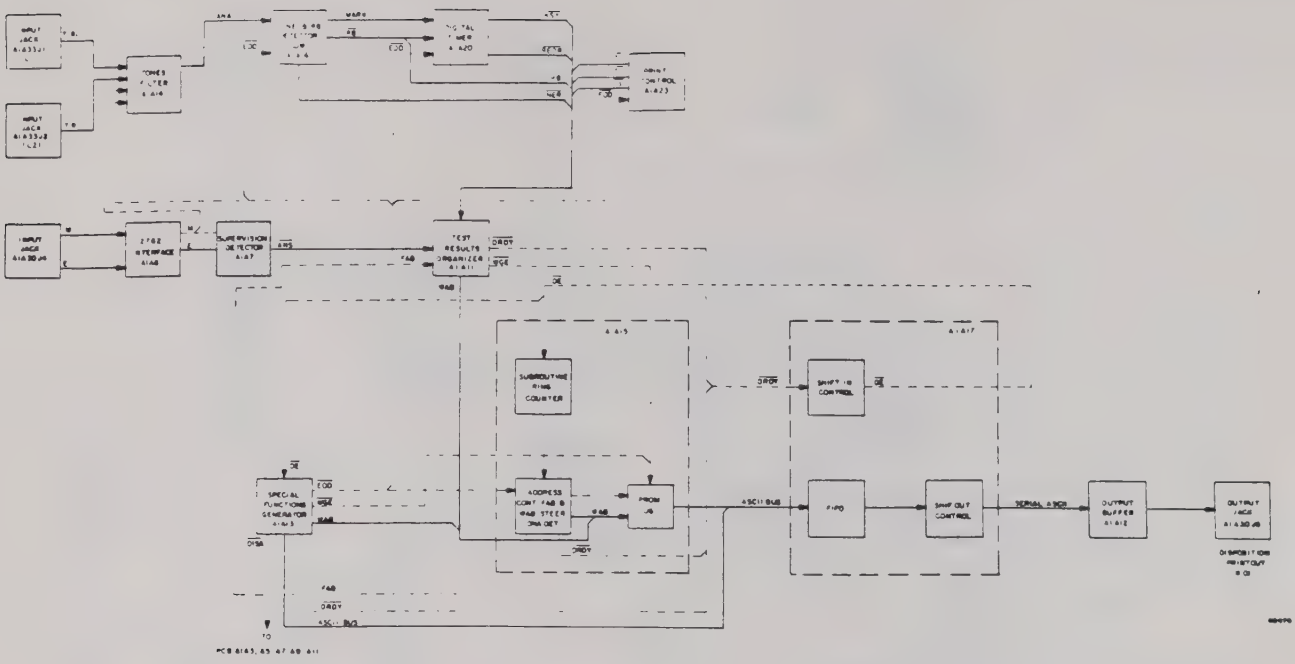


Figure 4—11. Model 2765, Block Diagram of Address Six Disposition Data Processing.

i. Patch output of a sinewave oscillator into Model 2765 L1 jack.

j. Set output of oscillator to provide 350 Hz ± 50 Hz at minimum amplitude.

k. Set oscilloscope to monitor dc volts with a vertical sensitivity of 5 V/cm.

l. Connect oscilloscope to test point TP1 with reference to analog ground pin 14 or R on pcb A1A16.

m. Connect a jumper lead from pin 6 of analog ground pin 14 on pcb A1A16.

n. Adjust potentiometer R9 (DC Offset Adj.) on pcb A1A16 until approximately zero volts is monitored. Continue this process to maximum sensitivity of oscilloscope.

o. Increase oscilloscope sensitivity and readjust potentiometer until approximately zero volts is monitored. Continue this process to maximum sensitivity of oscilloscope.

p. Disconnect oscilloscope from pcb A1A16.

q. Increase signal level of oscillator output (≈10 dB) until LED DS1 on pcb A1A16 extinguishes.

r. Remove patch cord from oscillator to Model 2765 L1 jack. The LED DS1 should light.

s. Connect external trigger of oscilloscope to test point TP2 on pcb A1A16. Set oscilloscope to trigger on negative-going portion of waveform.

t. Connect oscilloscope input to test point TP3 and set it to display a waveform of approximately ± 0.5 Vdc.

u. Patch oscillator to Model 2765 L1 jack while observing waveform on oscilloscope.

v. Adjust potentiometer R35 (Delay Sample Adj.) so waveform remains positive for 100 ms ± 5 ms after being triggered from test point TP2.

w. Repeat steps u and v until potentiometer R35 is properly set.

x. Set Model 2765 POWER switch to OFF position

y. Disconnect all test equipment from Model 2765 and connect all patch cords previously used in CDA System.

z. Remove extender card and insert pcb A1A16 into slot 16.

c. On page 5 – 17, delete paragraphs 5.98, 5.99, and 5.101, e and f.

d On page 5 – 17, change paragraph 5.101, c and d, to read

c. Adjust oscillator output amplitude for a 5.5 mV ± 0.1 mV or −43 dBm ± 0.1 dBm (600 ohm impedance) reading on AC Voltmeter.

d. Momentarily remove and connect oscillator input to Model 2765. If LED CR7 momentarily lights then extinguishes, turn potentiometer R33 counterclockwise while continuously removing and connecting oscillator input to Model 2765. Do this until LED CR7 stops following input (CR7 remains lit). If initially LED CR7 doesn't follow the input, follow the previously described procedure, except turn potentiometer R33 clockwise until LED CR7 starts to follow the input.

e. On page 5 – 19, Figure 5 – 3, Model 2765 Locations of Printed Circuit Board Calibration Controls, is superceded by Figure 5 – 3 in this errata.

6 In Section 6, perform the following:

a. On page 6 – 2, Table 6 – 3, Model 2765 Overall Assembly A1 Parts List is superceded by Table 6 – 3 in this errata

b On page 6 – 5, Table 6 – 9, change

1 Table title to read

Model 2765, Circuit Input Buffer Assy A1A2,A4 &A6 (96332) Parts List

2 CR31 reference designator to VR1

c. On page 6 – 7, Figure 6 – 2, Model 2765, Circuit Input Buffer, A1A2,A4 & A6 (96332) Component Location is superceded by Figure 6 – 2 in this errata.

d. On page 6-20, Table 6-16, Model 2765 Test Results Assy. A1A11 (96341) Parts List is superceded by Table 6 – 6 in this errata.

e. On page 6 – 21, Figure 6 – 9, Model 2765 Test Results Detector, A1A11 (96341) Component Location Diagram is superceded by Figure 6 – 9 in this errata.

f. On page 6 – 22, delete R22 from Table 6 – 17, Model 2765 Output Buffer Assy. A1A12 (96329) Parts List.

g. On page 6 – 23, Figure 6 – 10, Model 2765 Output Buffer, A1A12 (96329), Component Location diagram is superceded by Figure 6 – 10 in this errata.

h. On page 6 – 30, Table 6 – 21, Model 2765 Tones and Ringback Detector A1A16 (96506) Parts List is superceded by Table 6 – 21 in this errata

i. On page 6 – 31, Figure 6 – 14, Model 2765 Tones and Ringback Detector A1A16 (96506), Component Location Diagram is superceded by Figure 6 – 14 in this errata.

j. On page 6 – 34, delete Table 6 – 23

k. On page 6 – 35, delete Figure 6 – 16

l. On page 6 – 38 and 6 – 39, from Table 6 – 25 title and Figure 6 – 18 caption, delete the words and 22

m. On page 6 – 46, Table 6 – 29 and Figure 6 – 22 are superceded by Table 6 – 29 and Figure 6 – 22 in this errata

n. On page 6 – 49, Table 6 – 32, Model 2765 Thumbwheel Board Assy. A1A31A2 (96498 Parts List, delete S1 through S5

o. On page 6 – 49, Figure 6 – 25, Model 2765 Thumbwheel Board Assembly A1A31 (96498 Component Location drawing is superceded by Figure 6 – 25 in this errata

Section 7, the following figures are superceded by their corresponding figures in this errata

a. On page 7–2, Figure 7–1, Model 2765, Overall Schematic Diagram.

b. On page 7–10, Figure 7–9, Model 2765, Test Results Detector, A1A11, Schematic Diagram.

c. On page 7–11, Figure 7–10, Model 2765, Output Buffer, A1A12, Schematic Diagram

d. On page 7–13, Figure 7–12, Model 2765, Tones Filter, A1A14, Schematic Diagram.

e. On page 7–15, Figure 7–14, Model 2765, Tones and Ringback Detector, A1A16, Schematic Diagram

f. On page 7–16, Figure 7–15, Model 2765, Data Control, A1A17, Schematic Diagram

g. On page 7–19, Figure 7–18, Model 2765, Digital Timer, A1A20, Schematic Diagram.

8. In Section 7, on page 7–17, delete Figure 7–16, Model 2765, Tones Detector (High), A1A18, Schematic Diagram

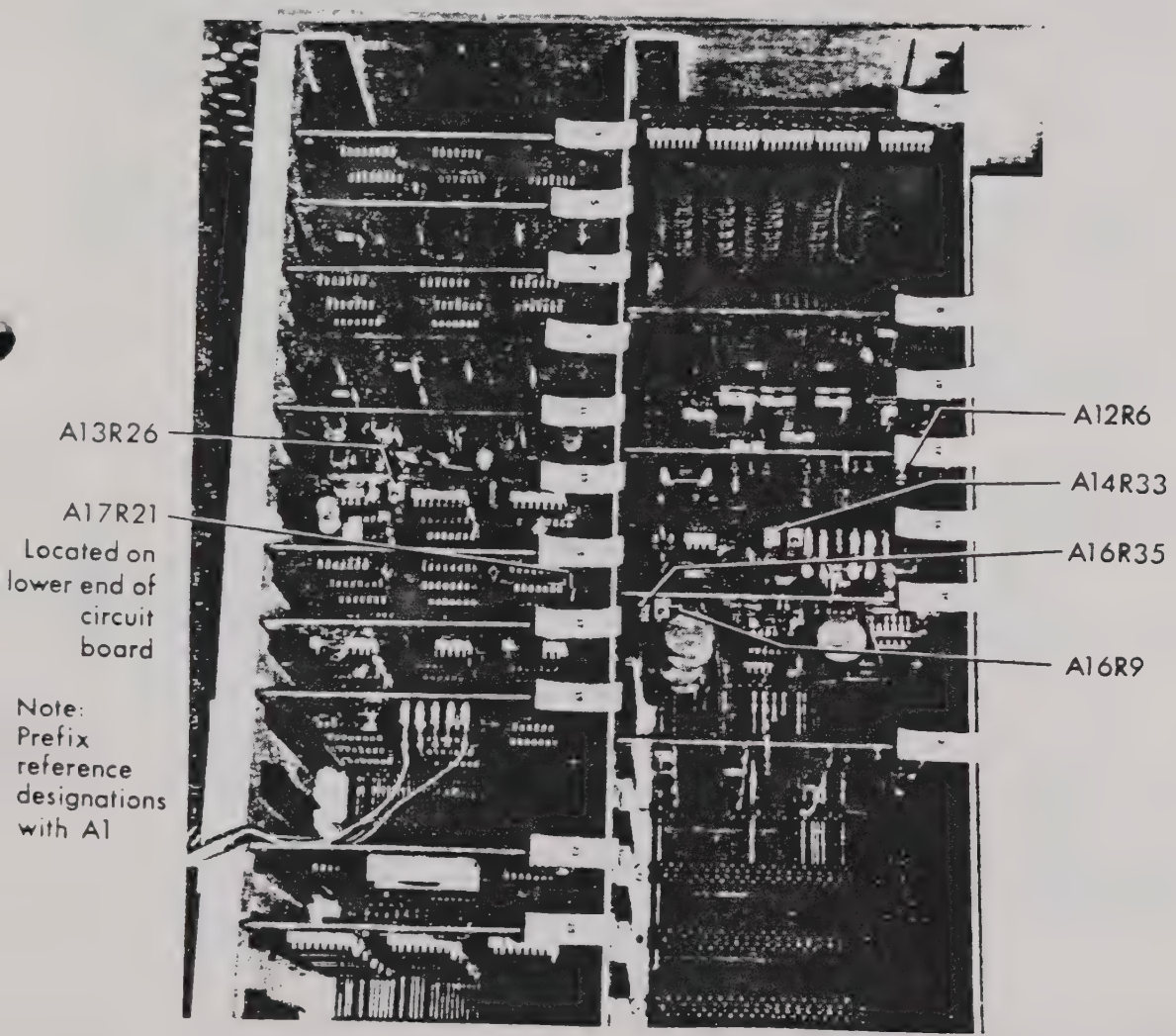
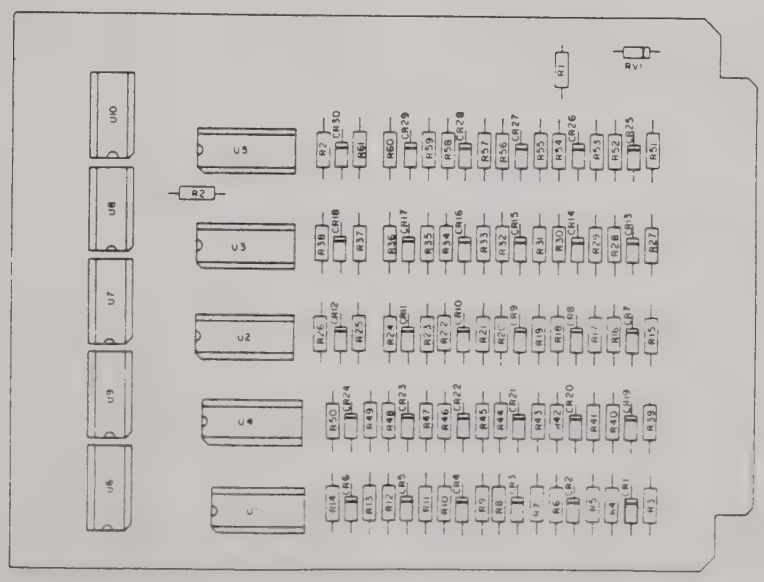


Figure 5–3. Model 2765 Locations of Printed Circuit Calibration Controls.

Table 6—3. Model 2765, Overall Assembly A1 Parts List.

REFERENCE DESIGNATOR	DESCRIPTION	MFGR.	MFGR. PART NO.	N.E.C. PART NO.
A2	ASSY 96332 CKT INPUT BUF			A276500032
A3	ASSY96333 24HR CLOCK			A276500033
A5	ASSY 96335 CKT ACCESS DET			A276500035
A7	ASSY 96337 OPTO SUPV DET			A276500037
A8	ASSY 96338 2762 INTERFACE			A276500038
A9	ASSY 96339 DIAL NO ORGAN			A276500039
A10	ASSY 96340 TTS-70 INTER			A276500040
A11	ASSY 96341 TST RESULT DET			A276500041
A12	ASSY96329 OUTPUT BUFF			A276500029
A13	ASSY 96343 SPEC FUNCT GEN			A276500043
A14	ASSY 96344 TONES FILTER			A276500044
A15	ASSY 96345 ADDRESS CONT			A276500045
A16	ASSY 96506 TONES & RB DET			A276500047
A17	ASSY 96330 DATA CONTROL			A276500030
A19	ASSY 96331 CALL INH CONT			A276500031
A20	ASSY 96346 DIGITAL TIMER			A276500046
A23	ASSY 96510 PRINT CONTROL			A276500048
A25	ASSY 96505 DISP. TIMERS			A276500049
A30	ASSY INTERCONNECTION BD			A276500036
A31	FRONT PANEL WIRING&ASSY			A276500028
A32	ASSY 01 INH MODULE			A276500019
A33	REAR PANEL WIRING&ASSY			A276500027
B1	42CFM 50/60HZ	AMPHENOL	760-99-XU-11115	920001200
MP1	FILTR,AL,5-3/4 SQ.X3/32	RPC	A217039	920100400
W1	3M CABLE			A276500020

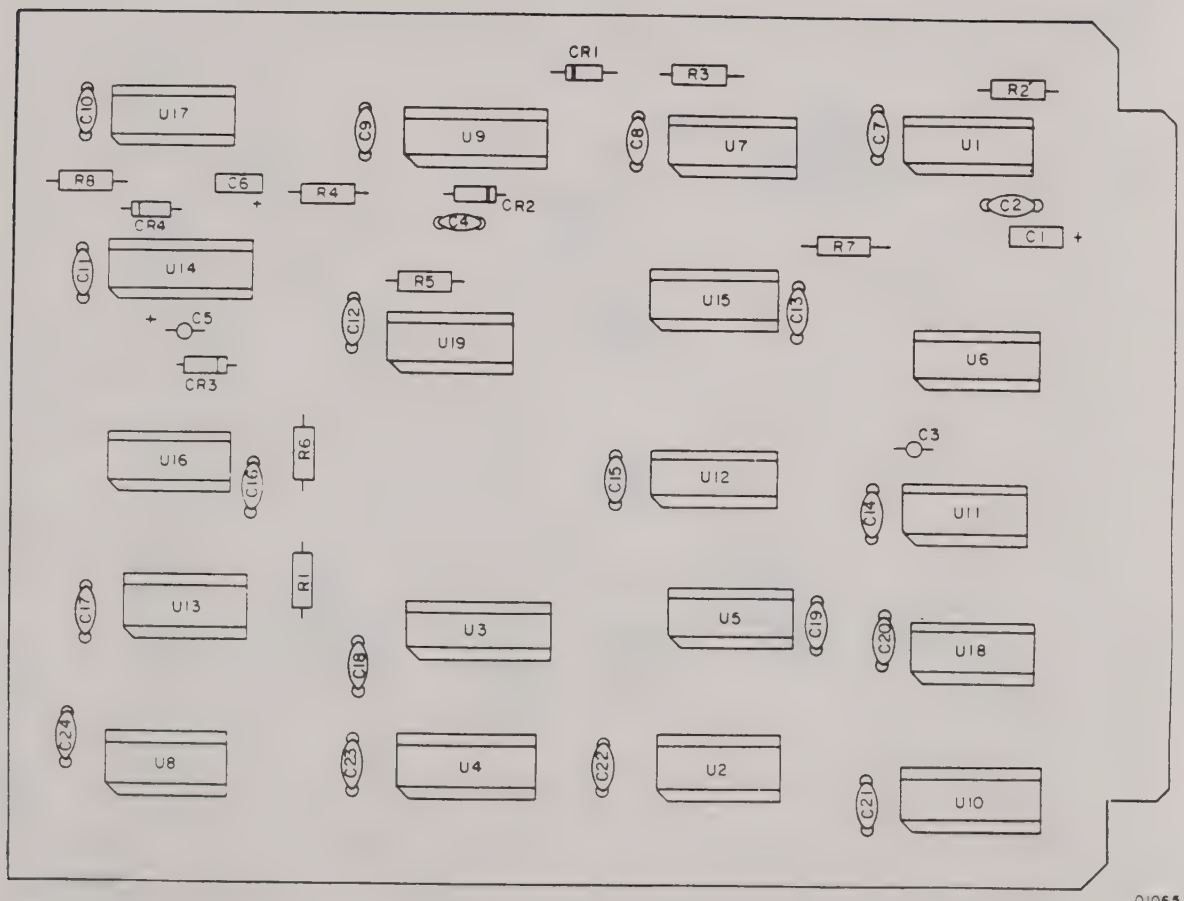


NOTE
PREFIX REFERENCE DESIGNATIONS WITH A1A2, A1A4 OR A1A6 AS APPROPRIATE

Figure 6—2. Model 2765, Circuit Input Buffer, A1, A2 & A6, (96332), Component Location.

Table 6—16. Model 2765, Test Results Assy. A1A11 (96341) Parts List.

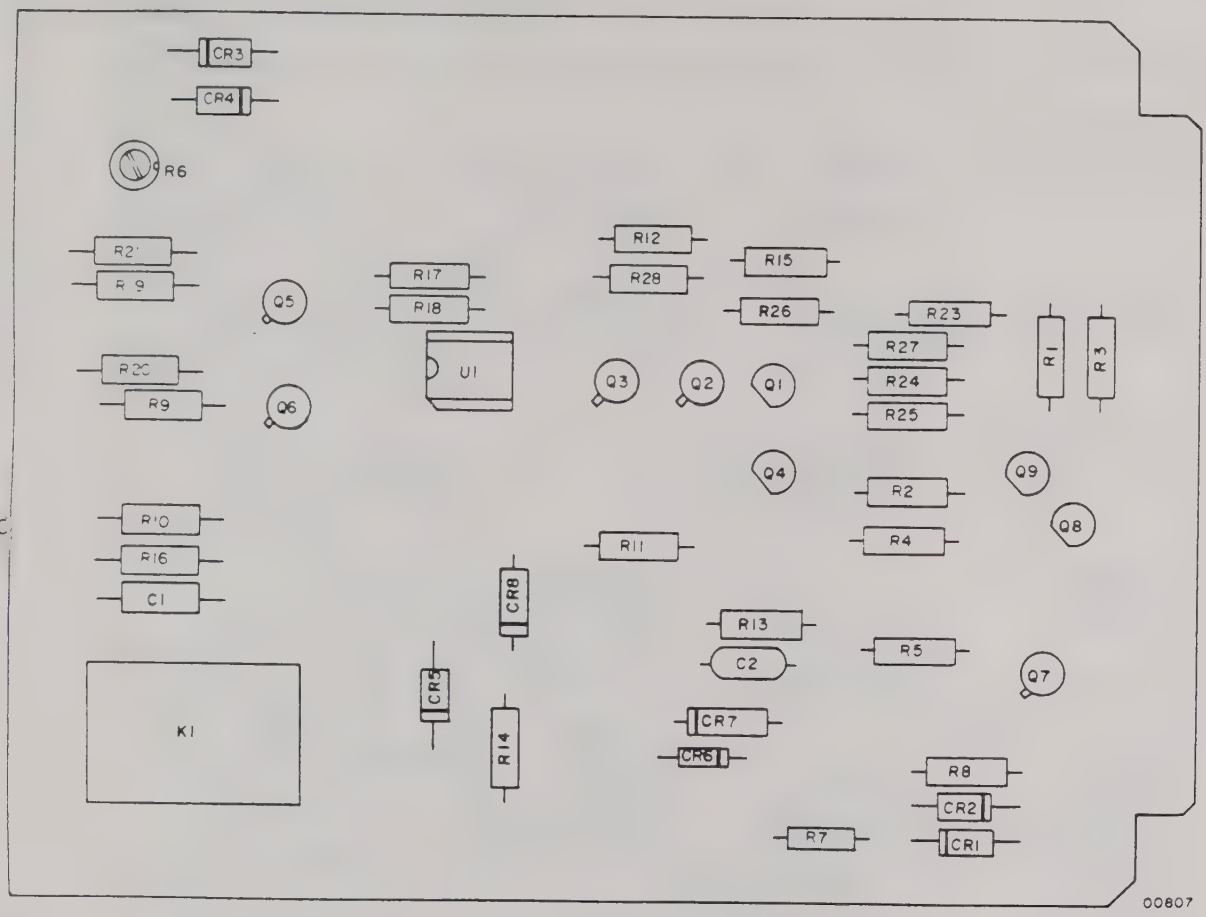
REFERENCE DESIGNATOR	DESCRIPTION				MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	22UF		10%	6V	05397	T330A226K006AS	310002260
C2	.01UF		20%	16V	71590	UK16-103	330701031
C3	82UF		10%	10V	13606	196D826X9010PE4	310808260
C4	SAME AS C2						
C5	SAME AS C3						
C6	100F		10%	10V	05397	T330A106K010AS	310001060
C7	SAME AS C2						
C8	SAME AS C2						
C9	SAME AS C2						
C10	SAME AS C2						
C11	SAME AS C2						
C12	SAME AS C2						
C13	SAME AS C2						
C14	SAME AS C2						
C15	SAME AS C2						
C16	SAME AS C2						
C17	SAME AS C2						
C18	SAME AS C2						
C19	SAME AS C2						
C20	SAME AS C2						
C21	SAME AS C2						
C22	SAME AS C2						
C23	SAME AS C2						
C24	SAME AS C2						
CR1	DO35	500MW		75V	12065	1N4148	560041480
CR2	SAME AS CR1						
CR3	SAME AS CR1						
CR4	SAME AS CR1						
R1	1K	1/4W	10%		01121	TYPE CB	200101026
R2	SAME AS R1						
R3	39K	1/4W	10%		01121	TYPE CB	200103936
R4	SAME AS R3						
R5	2.2K	1/4W	10%		01121	TYPE CB	200102226
R6	SAME AS R3						
R7	SAME AS R5						
R8	10K	1/4W	10%		01121	TYPE CB	200101036
U1	DILP				01295	SN7404N14P	510074040
U2	DILP				01295	SN7408N14P	510074080
U3	16DILP				01295	SN7475N	510074750
U4	16DILP				TI	SN74147N	510074147
U5	14PDIL				TI	SN7422N	510007422
U6	14DILP				01295	SN7405N	510074050
U7	14DILP				TI	SN7412N	510007412
U8	SAME AS U2						
U9	16DILP				TI	SN74123N	510074123
U10	16DILP	14PDIL			T.I.	SN7485N	510074850
U11	14PDIL				TI	SN7403N	510074030
U12	14DILP				01295	SN7400N	510074000
U13	14DILP				01295	SN7474N	510074740
U14	SAME AS U9						
U15	SAME AS U11						
U16	LP SCHOT				TI	SN74LS73N	510907473
U17	SAME AS U16						
U18	14DILP				01295	SN7430N	510074300
U19	SAME AS U2						



NOTE

PREFIX REFERENCE DESIGNATIONS WITH A1A11

Figure 6—9. Model 2765, Test Results Detector, A1A11 (96341), Component Location.



NOTE.

PREFIX REFERENCE DESIGNATIONS WITH A1A12.

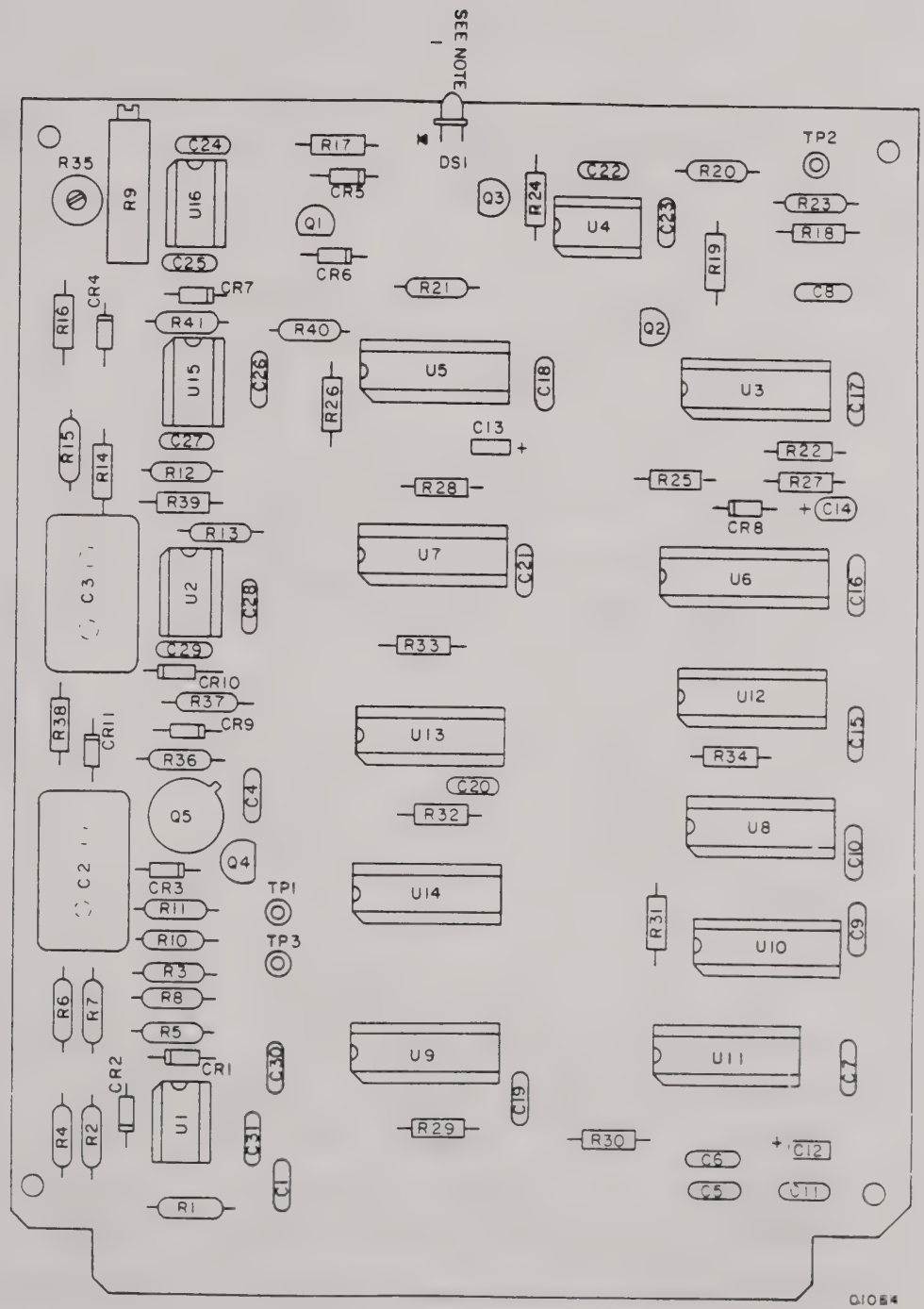
Figure 6—10, Model 2765, Output Buffer, A1A12 (96329), Component Location.

Table 6-21. Model 2765, Tones and Ringback Detector A1A16 (96506) Parts List.

REFERENCE DESIGNATOR	DESCRIPTION				MFGR.	MFGR. PART NO.	N.E.C. PART NO.
C1	1.0UF	Y5V TC	20%	50V	72962	8131-050-651-105M	330601050
C2	22UF		10%	15V	SPRAGUE	196D226X9015KA1	310802263
C3	.15UF		10%	100V	13606	225P15491XD3	320001540
C4	SAME AS C1						
C5	.01UF	Z5UTC	GMV	1KV	71590	DD-103	330101030
C6	SAME AS C5						
C7	.01UF		20%	16V	71590	UK16-103	330701031
C8	.1UF	Y5V TC	20%	50V	72962	8121-050-651-104M	330601040
C9	SAME AS C7						
C10	SAME AS C7						
C11	SAME AS C7						
C12	SAME AS C2						
C13	1UF		10%	35V	05397	T330A105K035AS	310001051
C14	68UF		20%	10V	13606	196D686X0010PE4	310806860
C15	SAME AS C7						
C16	SAME AS C7						
C17	SAME AS C7						
C18	SAME AS C7						
C19	SAME AS C7						
C20	SAME AS C7						
C21	SAME AS C7						
C22	SAME AS C5						
C23	SAME AS C5						
C24	SAME AS C5						
C25	SAME AS C5						
C26	SAME AS C5						
C27	SAME AS C5						
C28	SAME AS C5						
C29	SAME AS C5						
C30	SAME AS C5						
C31	SAME AS C5						
CR1	DO35	500MW		75V	12065	1N4148	560041460
CR2	SAME AS CR1						
CR3	SAME AS CR1						
CR4	SAME AS CR1						
CR5	SAME AS CR1						
CR6	SAME AS CR1						
CR7	SAME AS CR1						
CR8	SAME AS CR1						
CR9		500MW		100W	TI	1N459A	560004591
CR10	SAME AS CR9						
CR11	SAME AS CR1						
DS1	LED	75MA		1.6V	LITRONIX	RED-LIT2	564500100
Q1	TO92AFA	310MW		25V	04713	MPS6515	550065150
Q2	TO92	1-5MA		25D	04713	MPF103 2N5457	554001030
Q3	SAME AS Q1						
Q4	SAME AS Q1						
Q5	TO 71				MOTOROLA	2N4351	554004351
R1	10.5K	1/8W	1%		19701	MF5C	220210521

Table 6—21. (cont'd).

REFERENCE DESIGNATOR	DESCRIPTION		MFGR.	MFGR. PART NO.	N.E.C. PART NO.
R2	SAME AS R1				
R3	SAME AS R1				
R4	5230-	1/8W 1%	19701	MF5C	220252311
R5	SAME AS R4				
R6	4990-	1/8W 1%	19701	MF5C	220249911
R7	499K	1/8W 1%	19701	MF5C	220249931
R8	348K	1/8W 1%	19701	MF5C	220234831
R9	100K	.75W 10	80294	89PR100K	232501040
R10	2800-	1/8W 1%	19701	MF5C	220228011
R11	SAME AS R1				
R12	SAME AS R1				
R13	SAME AS R10				
R14	12K	1/4W 10%	01121	TYPE CB	200101236
R15	150K	1/8W 1%	19701	MF5C	220215031
R16	SAME AS R14				
R17	SAME AS R14				
R18	3.9K	1/4W 10%	01121	TYPE CB	200103926
R19	1M	1/4W 10%	01121	TYPE CB	200101056
R20	162K	1/8W 1%	19701	MF5C	220216231
R21	3480-	1/8W 1%	19701	MF5C	220234811
R22	1K	1/4W 10%	01121	TYPE CB	200101026
R23	3160-	1/8W 1%	19701	MF5C	220231611
R24	SAME AS R14				
R25	SAME AS R22				
R26	470-	1/4W 10%	01121	TYPE CB	200104716
R27	10K	1/8W 1%	19701	MF5C	220210021
R28	22-	1/4W 10%	01121	TYPE CB	200102206
R29	2.2K	1/4W 10%	01121	TYPE CB	200102226
R30	SAME AS R22				
R31	SAME AS R29				
R32	SAME AS R29				
R33	SAME AS R29				
R34	SAME AS R29				
R35	10K	1/2W 10% 200V	73138	62P10K	232701036
R36	100K	1/8W 1%	19701	MF5C	220210031
R37	47.5K	1/8W 1%	19701	MF5C	220247521
R38	SAME AS R14				
R39	100-	1/4W 10%	01121	TYPE CB	200101016
R40	26.7K	1/8W 1%	19701	MF5C	220226721
R41	909-	1/8W 1%	19701	MF5C	220290901
U1	8PDIL	80MW 180	18324	N5558V	500055580
U2	SAME AS U1				
U3	14PDIL		TI	SN7403N	510074030
U4	SAME AS U1				
U5	14DILP		TI	SN7414N	510007414
U6	16DILP		TI	SN74123N	510074123
U7	14DILP		01295	SN7474N	510074740
U8	14DILP		01295	SN7473N	510074730
U9	SAME AS U8				
U10	14DILP		01295	SN7490N	510074900
U11	SAME AS U10				
U12	SAME AS U10				
U13	SAME AS U3				
U14	SAME AS U3				
U15	SAME AS U1				
U16	SAME AS U1				



NOTE

1. DSI MOUNTED WITH BEAD STANDOFFS AND BENT AS SHOWN. FLAT SIDE OF DSI IS TO THE LEFT.
2. PREFIX REFERENCE DESIGNATIONS WITH A1A16.

Figure 6-14. Model 2765, Tones and Ringback Detector, A1A16 (96506), Component Location.

Table 6—29. Model 2765, Front Panel Assembly A1A31, Parts List.

REFERENCE DESIGNATOR	DESCRIPTION			MFGR.	MFGR. PART NO.	N.E.C. PART NO.
A1	POWER SUPPLY ASSY					A276500016
A2	CKT BD THUMB WHEELS					A276500050
DS1		60MA	5V	DATA DISPL	F62-A1-R0	730200500
DS2		30MA	5V	DATA DISPL	F62-A1-W0	730200300
DS3		20MA	5V	MONSANTO	MV5023	564500900
S1	DPDT	5A	28V	09353	7201P	620400600
S2	SAME AS S1					
S3	SPDT	1A	28V	C&K	8121	635200700
S4	SAME AS S3					
S5	SW THMBWHL BCD COMPL			DIGITRAN	29119-2P	626800500
S6	SAME AS S5					
S7	SAME AS S5					
S8	SAME AS S5					
S9	SAME AS S5					
W1	FRONT PANEL CABLE					A276500018

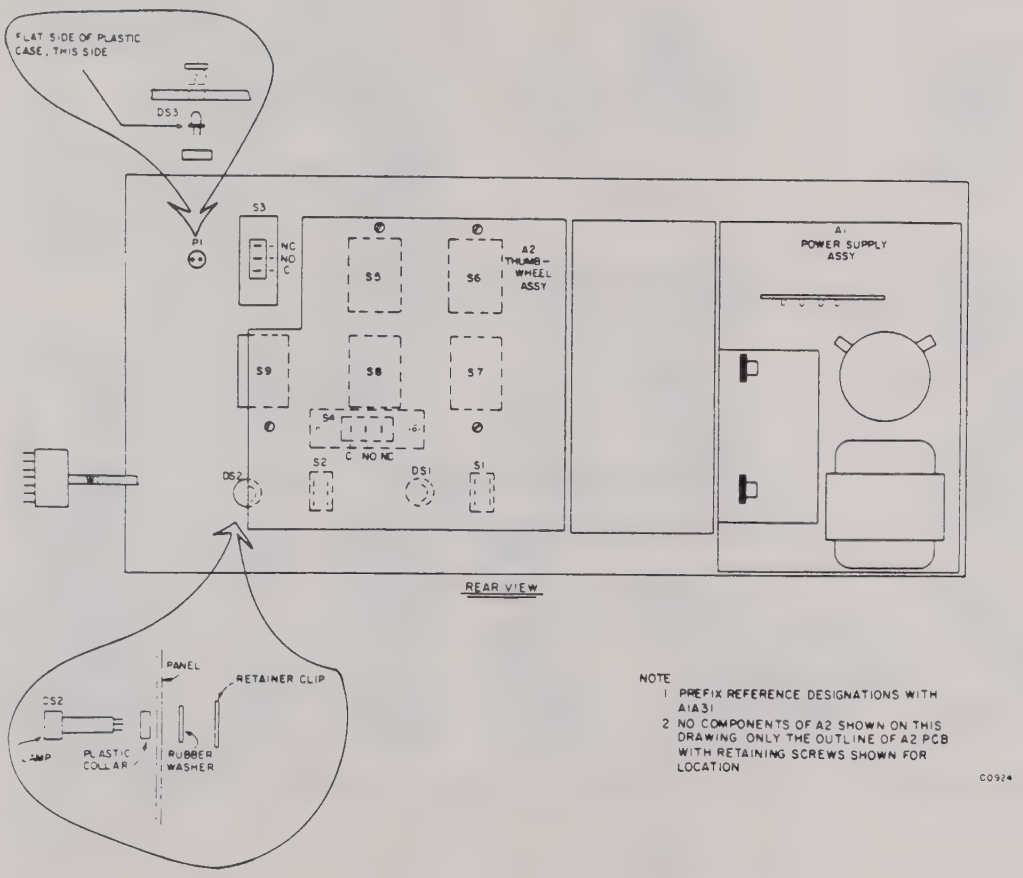


Figure 6—22. Model 2765, Front Panel Assembly A1A31, Component Location.

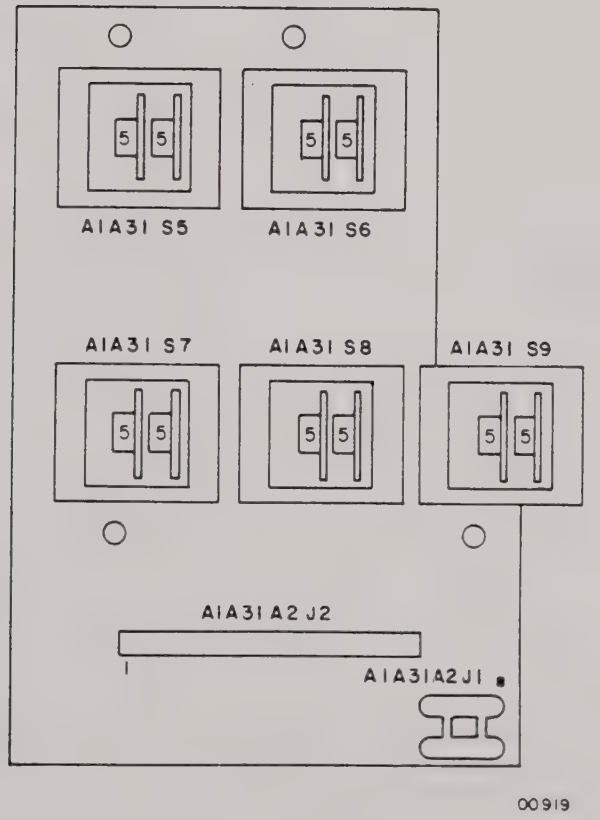


Figure 6—25. Model 2765, Thumbwheel Board Assembly A1A31A2 (96498), Component Location.

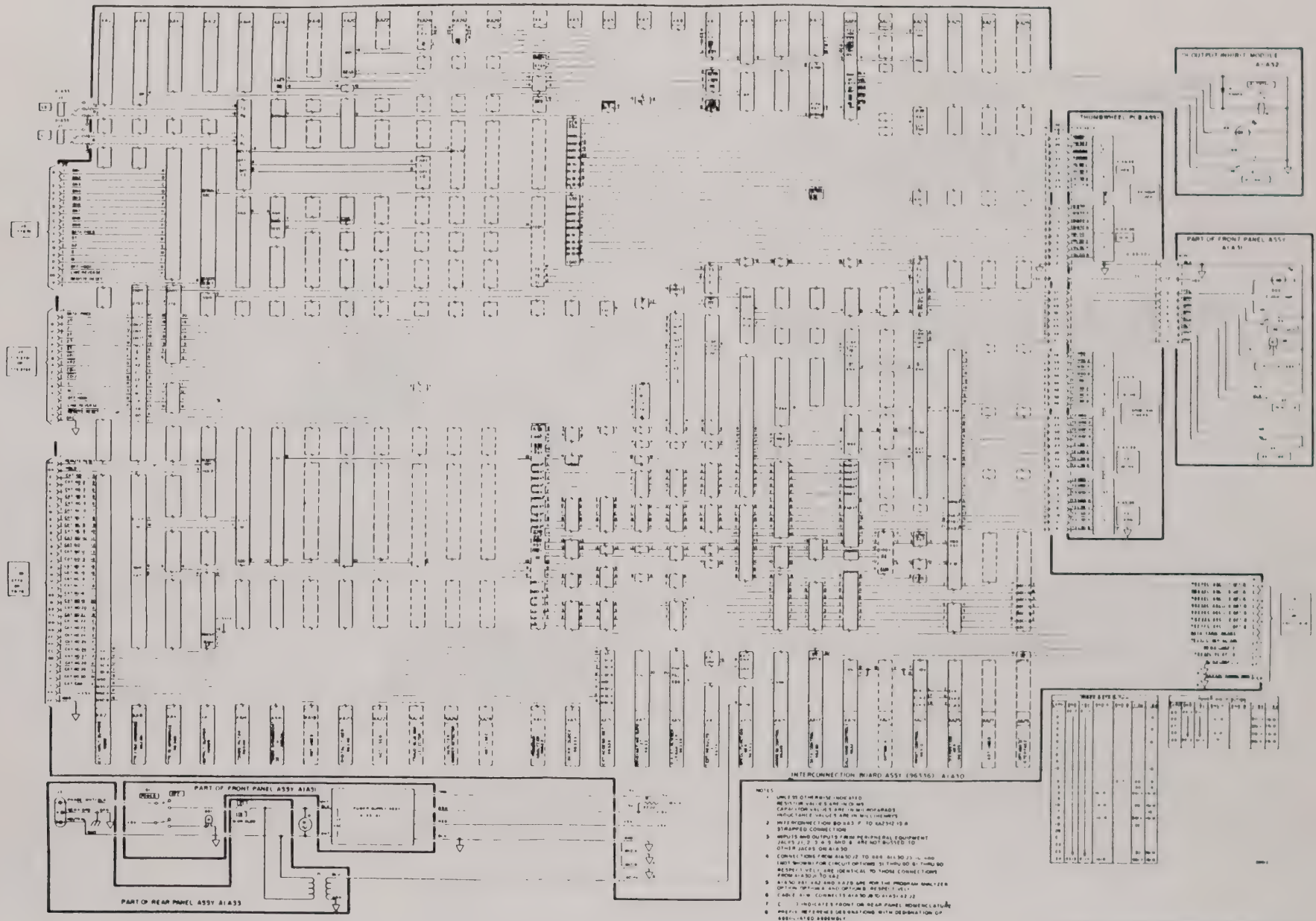


Figure 7-1 Model 2765, Overall Schematic Diagram

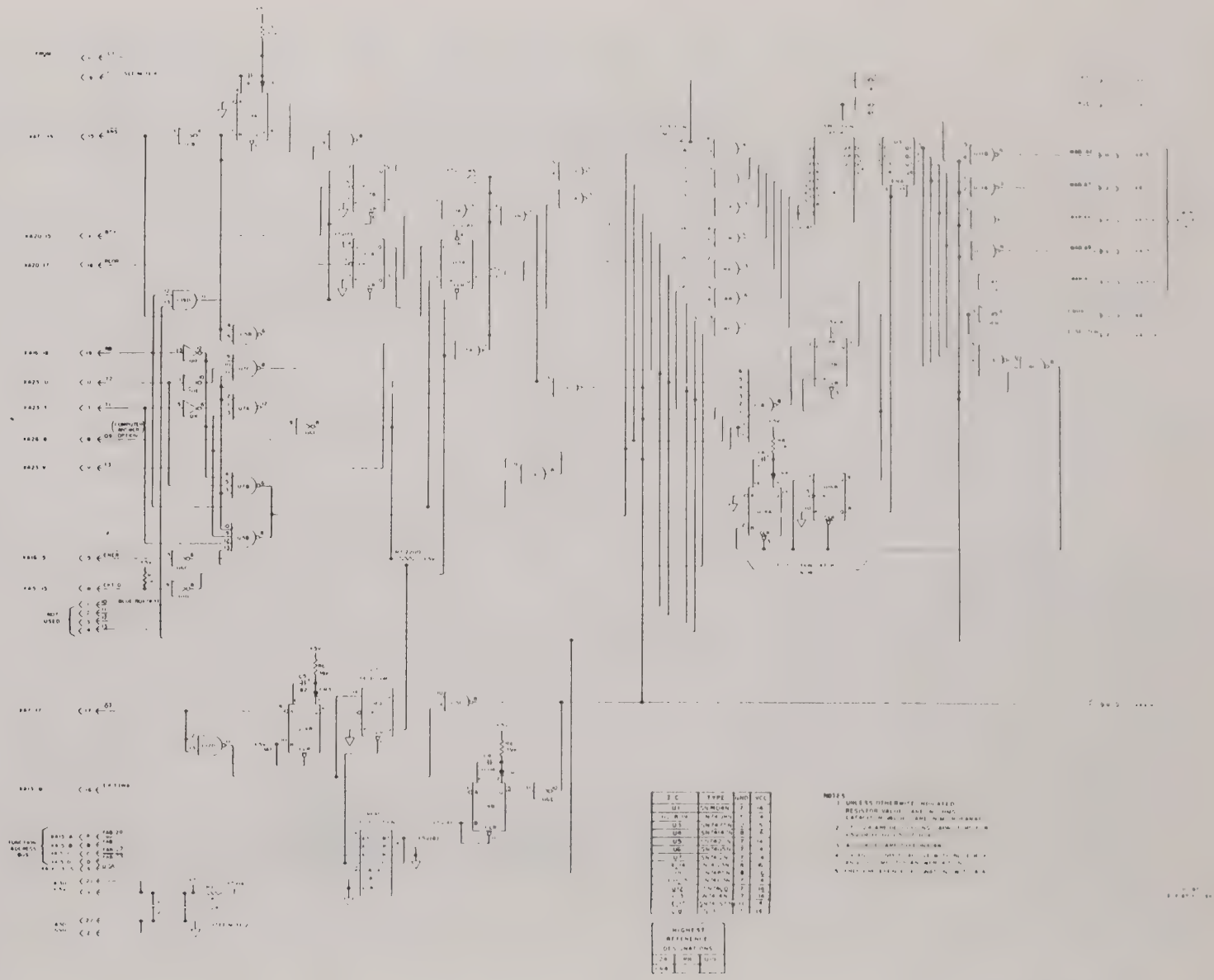


Figure 7-9. Model 2765, Test Results Detector, A1A11, Schematic Diagram

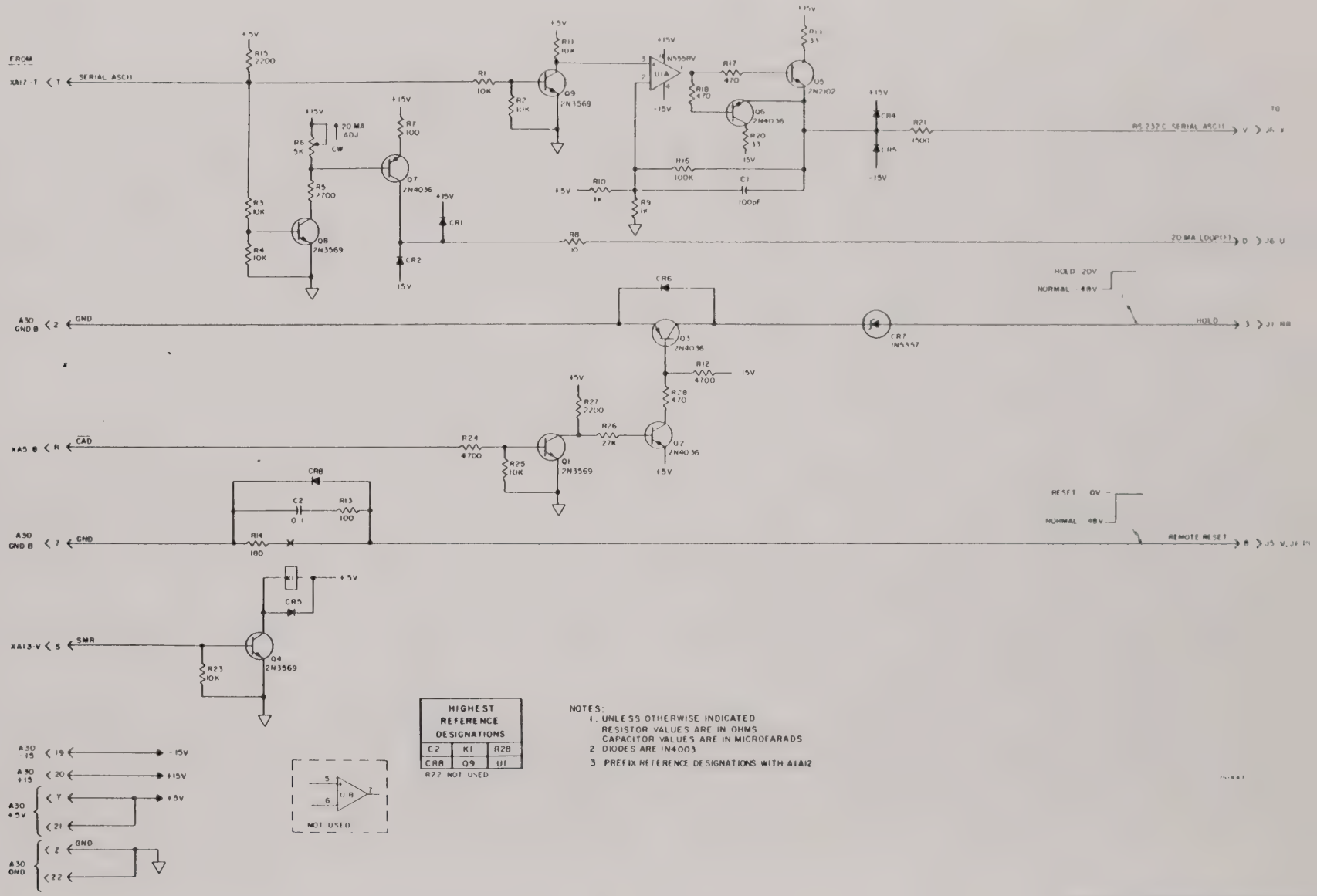


Figure 7-10 Model 2765, Output Buffer A1A12, Schematic Diagram

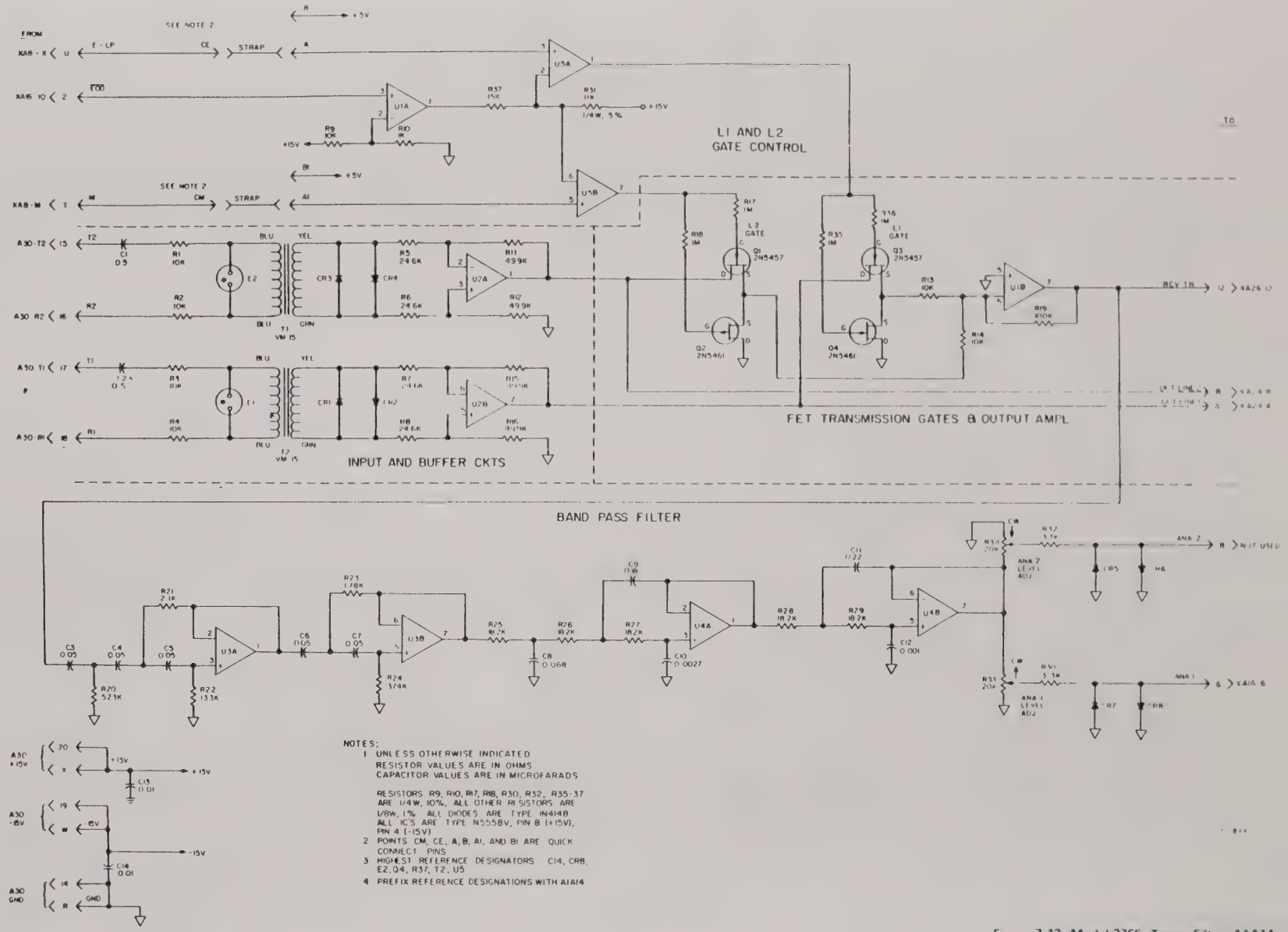
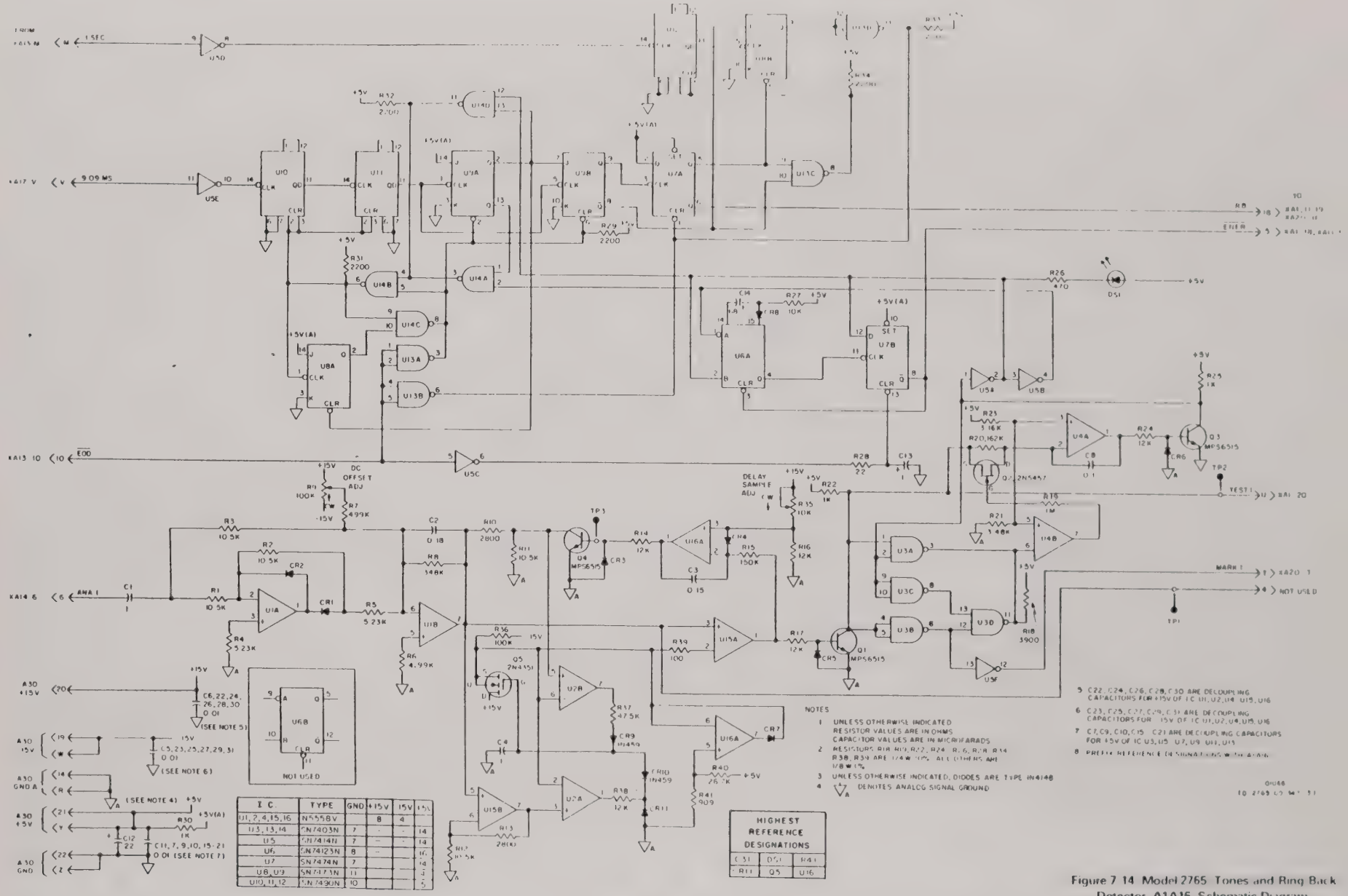

LI AND L2
GATE CONTROL
FET TRANSMISSION GATES & OUTPUT AMPL
INPUT AND BUFFER CKTS
BAND PASS FILTER
SEE NOTE 2
STRAP
+15V
-15V
L2 GATE
LI GATE
ANA 2 LEVEL ADJ
ANA 1 LEVEL ADJ
NOT USED
NOTES:
1 UNLESS OTHERWISE INDICATED
RESISTOR VALUES ARE IN OHMS
CAPACITOR VALUES ARE IN MICROFARADS
RESISTORS R9, R10, R17, R18, R30, R32, R35-37 ARE 1/4W, 10%, ALL OTHER RESISTORS ARE 1/8W, 1%. ALL DIODES ARE TYPE IN4148
ALL IC'S ARE TYPE N5558V, PIN 8 (+15V), PIN 4 (-15V)
2 POINTS CM, CE, A, B, AI, AND BI ARE QUICK CONNECT PINS
3 HIGHEST REFERENCE DESIGNATORS C14, CR8, E2, Q4, R37, T2, U5
4 PREFIX REFERENCE DESIGNATIONS WITH A1A14

Figure 7-12 Model 2765, Tones Filter, A1A14, Schematic Diagram



I C	TYPE	GND	+15V	-15V	+5V
U1, 2, 4, 15, 16	LM555CN	1	8	4	
U3, 13, 14	SN7403N	7	-	-	14
U5	SN7414N	7	-	-	14
U6	SN74123N	8	-	-	16
U7	SN7474N	7	-	-	14
U8, U9	SN7473N	11	-	-	5
U10, 11, 12	SN7490N	10	-	-	5

HIGHEST REFERENCE DESIGNATIONS		
C31	DS1	R41
CR11	Q5	U16

NOTES
1. UNLESS OTHERWISE INDICATED RESISTOR VALUES ARE IN OHMS CAPACITOR VALUES ARE IN MICROFARADS
2. RESISTORS R1A, R1B, R22, R24, R 6, R 7, R 14, R38, R39 ARE 1/4 W ±1% ALL OTHERS ARE 1/8 W ±1%
3. UNLESS OTHERWISE INDICATED, DIODES ARE TYPE IN4148
4. ⏚A DENOTES ANALOG SIGNAL GROUND
5. C22, C24, C26, C28, C30 ARE DECOUPLING CAPACITORS FOR +15V OF IC U1, U2, U14, U15, U16
6. C23, C25, C27, C29, C31 ARE DECOUPLING CAPACITORS FOR -15V OF IC U1, U2, U4, U15, U16
7. C7, C9, C10, C15 - C21 ARE DECOUPLING CAPACITORS FOR +5V OF IC U3, U5, U7, U9, U11, U13
8. PREFIX REFERENCE DESIGNATIONS WITH A1A16

Figure 7-14. Model 2765 Tones and Ring Back Detector, A1A16, Schematic Diagram

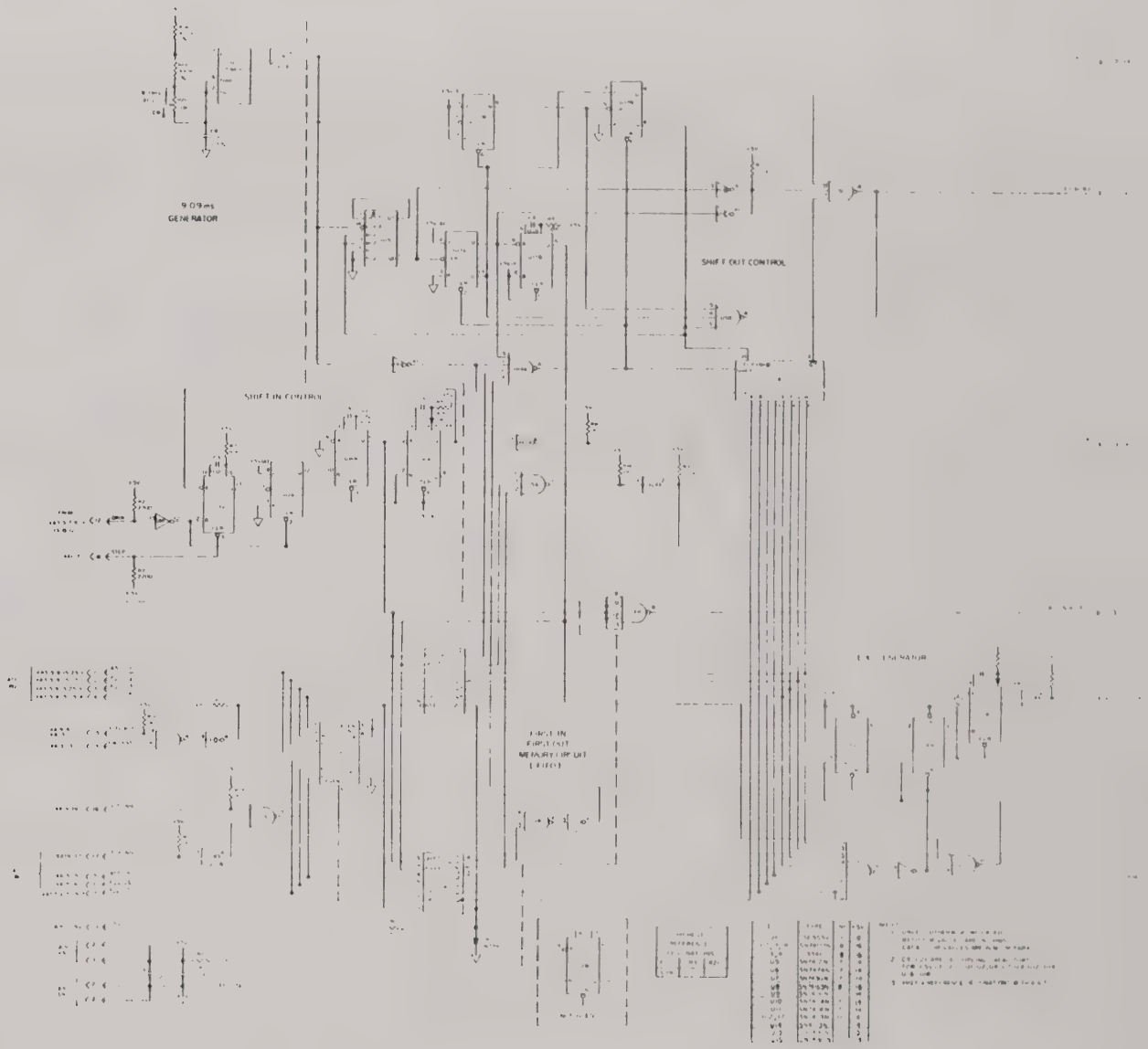


Figure 7-15. Model 2765, Data Control, A1A17, Schematic Diagram

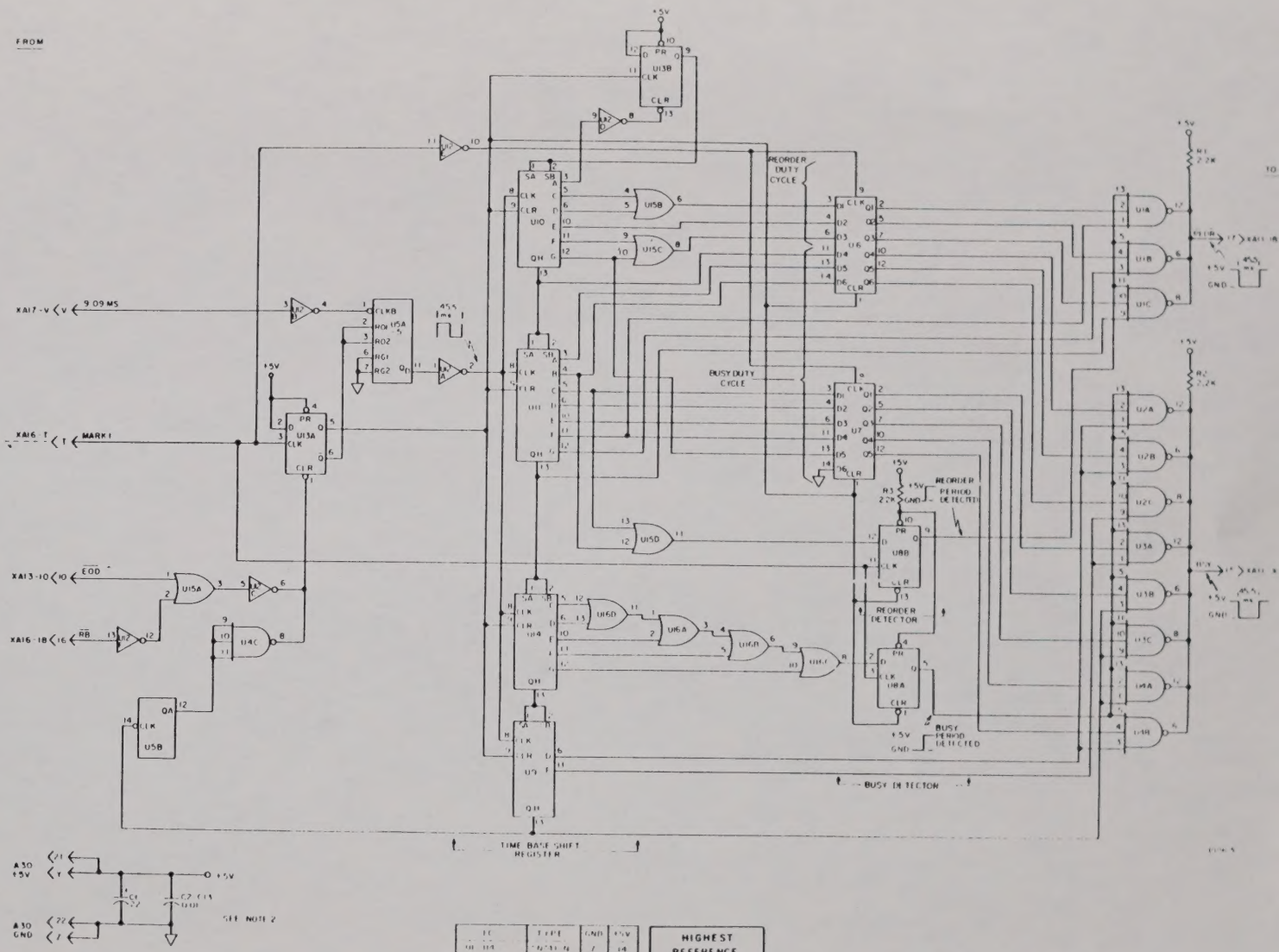
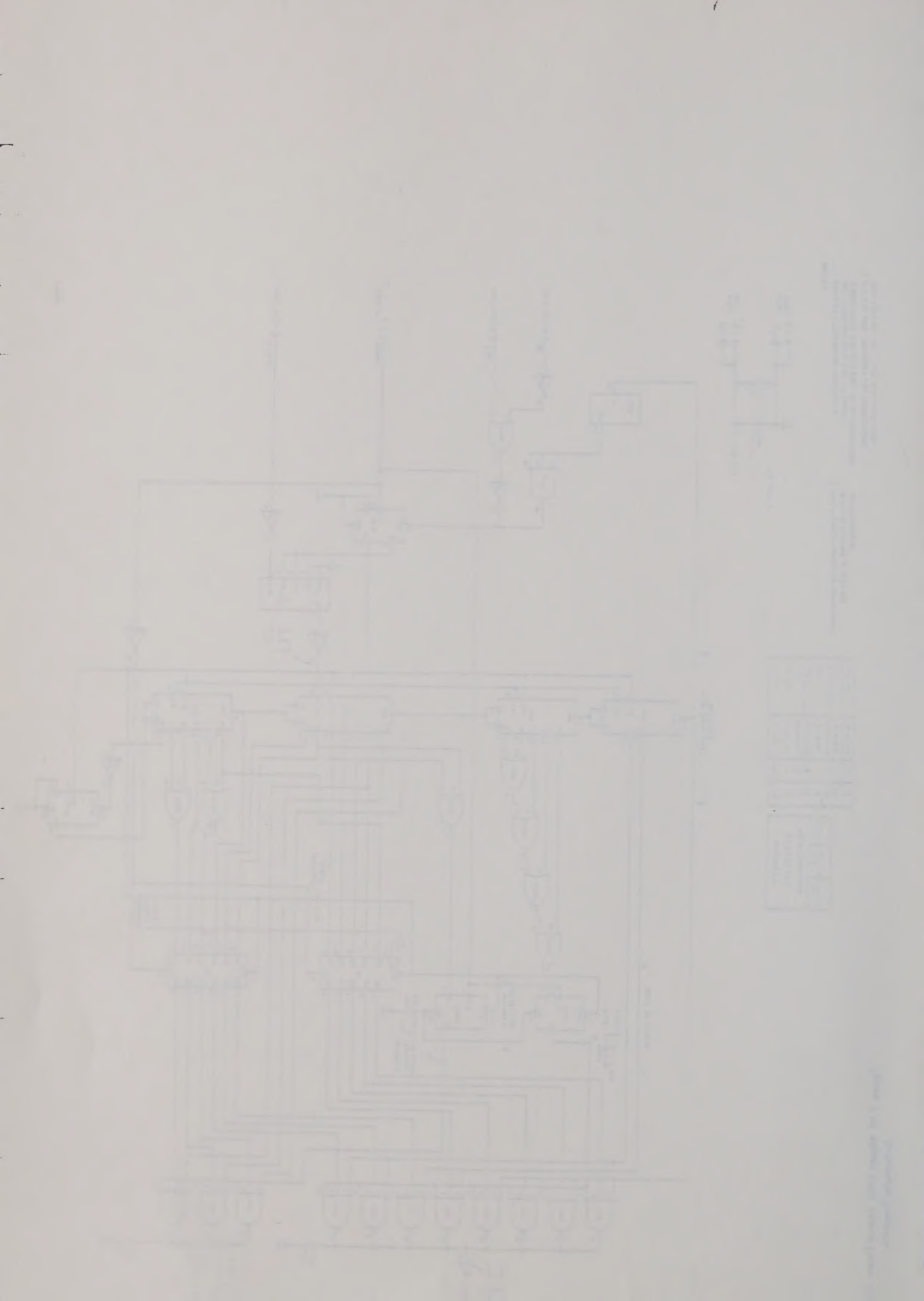
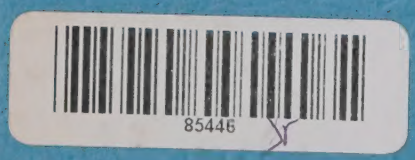


Figure 7-18 Model 2765, Digital Timer, A1A20 Schematic Diagram





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